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A Behavior Analytic Model for Nonorganic Failure to Thrive: Observations of Parent and Child Behavior During Feeding Interactions.

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A BEHAVIOR ANALYTIC MODEL FOR NONORGANIC FAILURE TO THRIVE: OBSERVATIONS OF PARENT AND CHILD BEHAVIOR DURING FEEDING INTERACTIONS

A Dissertation

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in

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by
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Abstract

This study was the first to apply a behavior analytic model of assessment to failure to thrive (FTT) by observing parent and child behavior during mealtimes at hospitalization for provisional diagnosis of FTT. Descriptive data (e.g., child growth parameters, temperament, and developmental status; maternal medical history and psychopathology; and demographic information) also were collected. The specific goal, however, was to identify feeding behaviors that differed in rate of occurrence in parent-child dyads in which the child was classified: (a) nonorganic failure to thrive (NOFTT) or Mixed FTT (e.g., physical and psychosocial etiology), (b) organic failure to thrive (OFTT), or (c) normal weight and hospitalized due to acute illness (control).

Statements with regard to differential behavior patterns for control and NOFTT-Mixed FTT dyads must be viewed cautiously due to nonsignificant multivariate group comparisons. However, trends, based on effect size statistics, indicated behaviors that were the most discrepant between groups were those that accentuated the reciprocity of parent-child interaction in the development of NOFTT. Furthermore, correlations of some behaviors with child's age and feeding method, implied that "types" of FTT based on child's age (Linsheid & Rasnake, 1985), may be an appropriate conceptualization.

Specifically, NOFTT-Mixed FTT parents were more likely to display a lack of active visual, verbal, or physical contact with their child during meals (i.e., Non-Interaction) and were generally less interactive than control parents (i.e., Mean Parent Behavior, Non-Negative Verbal). Relative to control children, NOFTT-Mixed FTT children displayed less non-aversive vocal or physical behavior (i.e., Social Interaction). Unexpectedly, control children tended to display food refusal more often than NOFTT-Mixed FTT children.

In spite of nonsignificant multivariate group comparisons, this study provided a useful methodology for observational studies of parent-child feeding interactions in hospitalized FTT and normal weight children. Because trends in the behavioral data generally supported this study's hypotheses, the Feeding Interaction Code (FIC) may be viewed as a workable observational system to evaluate parent and child mealtime behavior.

Introduction

Nonorganic failure to thrive in infancy (NOFTT) is a biopsychosocial disorder (Schwartz, 1985) in which dysfunctional interactions, particularly feeding interactions, between an infant and his or her parent(s) result in undernutrition and poor weight gain. Specifically, NOFTT is a descriptor used to identify infants who experience a severe deficit in rate of weight gain that can not be attributed to an organic etiology.

Although NOFTT was first identified over 85 years ago (Holt, 1899 cited by Drotar, 1985), subsequent research has provided only tentative answers regarding the description, etiology, and course of NOFTT. Empirical investigations of NOFTT have been limited by subjective measurements, retrospective and uncontrolled designs, small sample sizes, and a lack of integrative conceptual models. Research has been hampered also by a lack of consensus among authors in the definition of NOFTT. The less-specific term, failure to thrive (FTT), especially has become a catchall for a variety of organic and nonorganic growth disorders (Smith & Berenberg, 1970). Confusion due to inconsistently used terminology has prompted some researchers to call for the retirement of the FTT label and for the use of more operationally defined terms when discussing inappropriate weight gain or growth (e.g., Stickler, 1984).

Regardless of the etiology (i.e., organic or nonorganic), FTT is a problem of undernutrition (Bithoney & Dubowitz, 1985). Undernutrition in FTT may be attributed to situational (e.g., poverty, stress) variables, perinatal variables, physical or behavioral deficits of child or parent(s), and interactive variables (e.g., dysfunctional parent-infant interactions) that decrease the likelihood adequate nutrition will be delivered to, or properly metabolized by, the child (Klien, 1987). In addition, chronic undernutrition that results in FTT has been associated with poor developmental outcomes, such as increased health problems and risk of mortality, behavior problems, and cognitive and developmental delays (Drotar Malone, & Negray, 1980; Drotar & Sturm, 1988; Field, 1984b; Galler, Ramsay, & Solimano, 1985; Singer & Fagan, 1984; Singer, 1987).

The purpose of this review is to describe NOFTT, to discuss variables associated with poor weight gain in infancy, and to present models for conceptualizing NOFTT. Following the literature review, the purpose and hypotheses of this study of parent--infant dyads interacting during mealtimes will be presented.

Description of Failure to Thrive

Definition. Failure to thrive in infancy (FTT) is indicated when weight-for-age is persistently below the 5th percentile or is less than 80-85% of the ideal weight-for-age relative to standardized growth charts. The deficit in rate

of weight gain must be persistent rather than acute. FTT also refers to failure to maintain an established weight gain pattern represented by a loss of two or more major percentiles on a child's growth curve (e.g., 50th, 25th, 10th). A child whose weight for age is low, but whose rate of weight gain is steady (i.e., tracks his or her "own" growth curve), however, is not considered FTT (Accardo, 1982).

Given this definition, FTT might more aptly be called "Failure to Gain Weight" (Stickler, 1984). FTT is used best as a descriptive term for a syndrome of weight retardation, rather than a diagnostic category (English, 1978). In fact, FTT is a growth symptom of virtually all serious pediatric illnesses (Wershil, 1988) and could be applied to any young child making "suboptimal physical or developmental progress" (Bacon, Spencer, Hopwood, & Kelch, 1982, p. 95).

Incidence. FTT is a prevalent pediatric problem, accounting perhaps for 1% of hospitalized children and occurring in infants younger than 18 months in 80% of cases (Kotelchuck & Newberger, 1978; Schor, 1984). Mitchell, Gorrell, and Greenburg (1980) reported that FTT affects 10% of the rural outpatient pediatric population and 3% to 5% of all infants younger than one year admitted to pediatric teaching hospitals.

Organic versus nonorganic FTT. FTT traditionally has been dichotomized into two mutually exclusive categories based on presumed etiology. In organic FTT (OFTT), a physical

disorder is present, whereas in nonorganic FTT (NOFTT), no organic disorder is identified. Rather, in the absence of identified organic etiology, NOFTT is assumed to result from psychosocial variables, such as "emotional deprivation", parental neglect, conditions of poverty, an irritable or passive infant, parental psychopathology, and/or feeding problems (Roberts & Maddux, 1982).

Often a diagnosis of NOFTT is made by ruling out organic causes, such as neurological, gastrointestinal, endocrine, cardiovascular, pulmonary, renal, or metabolic disorders (Bacon et al., 1982). Diagnosing NOFTT by exclusion of organic causation, however, can be expensive and time-consuming, particularly when numerous laboratory tests are utilized (Homer & Ludwig, 1981). Although some researchers have found organic disorders in approximately 50% of hospitalized FTT patients, the more common finding indicates physical illness in about 25% of FTT cases (Bacon et al., 1982; Bithoney & Rathbun, 1983). Furthermore, an organic basis for FTT often can be determined by a careful clinical history and physical examination, rather than by an expensive laboratory investigation (Berwick, Levy, Kleinerman, 1982; Gardner, 1978; Homer & Ludwig, 1981; Sills, 1978).

A number of authors have questioned the utility of a dichotomous nosology for FTT (e.g., Accardo, 1982; Krieger, 1982). The identification of an organic etiology for weight loss does not preclude behavioral components of the disease,

and weight loss due to psychosocial variables ultimately makes the infant more susceptible to physical disorders (Bithoney & Dubowitz, 1985; Frank, 1985). Bithoney and Rathbun (1983) and Homer and Ludwig (1981), therefore, suggested FTT is best described using three etiologic categories: (a) organic, (b) nonorganic, and (c) mixed (i.e., physical and psychosocial contributants). Such a nosology adequately accounts for the interactive influences of organic disease and psychosocial variables on infant weight gain and acknowledges the continuous, rather than dichotomous, nature of the etiology of FTT.

With regard to FTT in the absence of an organic etiology, Linscheid and Rasnake (1985) proposed two types of NOFTT based on age of onset and behavioral analyses of parent-infant interactions. Type I NOFTT is characterized by dysfunctional parent-infant interactions across multiple situations that result in failure to gain weight at an early age (i.e., before eight months). In contrast, Type II NOFTT typically is present when an infant is eight months or older and involves weight gain failure primarily due to poor feeding interactions (e.g., food refusal or food selectivity resulting in conflictual mealtime interactions and inadequate caloric intake).

NOFTT and reactive attachment disorder. Some authors (Derivan, 1982; Harris, 1982) have categorized NOFTT in psychiatric terms, thus classifying it as reactive attachment

disorder of infancy or early childhood (RAD). In fact, the diagnostic criteria for RAD closely resemble the main features associated with NOFTT. These features include lack of adequate caregiving, developmental delay, unresponsive or irritable infant behavior, feeding difficulties, poor weight gain, lack of organic etiology, and reversal of the clinical picture after adequate caretaking (Harris, 1982).

The DSM III-R diagnostic criteria for RAD specifies the age at onset before five years (American Psychiatric Association, 1987). Either a persistent failure to initiate or to respond in most social situations or an indiscriminate sociability is seen in a child with RAD. Inadequate care of the RAD child is evidenced by a caregiver's persistent disregard of the child's emotional needs for comfort, stimulation, and affection; persistent disregard of the child's physical needs, including nutrition, adequate housing, and protection from physical danger and assault; or repeated change of primary caregiver so that stable attachments are not possible (i.e., frequent changes in foster parents).

In spite of similarities, the terms NOFTT and RAD cannot always be used interchangeably. The RAD criteria are most consistently seen in children who have been abused or neglected. Although child maltreatment may be implicated in the etiology of NOFTT, weight gain failure frequently occurs in the absence of documented maltreatment. In addition, NOFTT is a descriptor best reserved for children under three years

old. Furthermore, according to DSM III-R, if FTT is present in a child diagnosed with RAD, FTT is coded separately on Axis III (i.e., physical disorders).

NOFTT and psychosocial dwarfism. Although both NOFTT and psychosocial dwarfism (PSD) appear to be preceded by psychosocial deprivation (Money & Needleman, 1980), NOFTT reflects weight gain deficits and PSD indicates growth failure (i.e., height and weight deficits). In contrast to NOFTT infants, PSD children frequently suffer from long-term abuse and neglect (Money & Needleman, 1976) and exhibit bizarre behavior, such as night wandering, eating from garbage cans, drinking from rain puddles or toilet water, pain agnosia, and self-injury (Green, Campbell, & David, 1984; Harris, 1982). Whereas NOFTT is essentially a problem of undernutrition in infants aged three or younger, PSD is present usually in children older than three years and is not linked clearly to nutritional factors (Bacon et al., 1982).

An additional distinction between NOFTT and PSD involves the pathogenesis of the disorders. In PSD, also referred to as reversible hyposomatotrophin dwarfism, "psychosocial stress mediated through the central nervous system (CNS) effects (neuro)endocrine changes, which, in turn, may cause severe growth retardation" (Green et al., 1984, p. 39). In fact, PSD presents clinical and laboratory findings analogous to those found in idiopathic hypopituitary dwarfism (IHD), which is statural growth failure secondary to failure of

somatotrophin (Money & Needleman, 1976). Whereas IHD can be treated with growth hormone therapy, PSD is completely reversed by removal from the home environment to a domicile or to a hospital in which nurturant care is provided.

PSD has been associated with decreases in adrenocorticotropic hormone, which is secreted by the hypothalamus in response to stress (Gardner, 1977). Chronic psychosocial stress also may result in growth retardation via high levels of cortisol secretion (Krieger, 1982). In addition, PSD patients have been shown to have low plasma growth hormone concentrations (Green et al., 1984). Impaired neurotransmitter mechanisms (e.g., dopamine or norepinephrine) also might impede normal growth hormone regulation in PSD children (Gardner, 1977).

In contrast to PSD patients, NOFTT patients (i.e., infants below age three exhibiting weight gain failure) do not typically exhibit growth hormone deficiency. Psychosocial deprivation and undernutrition appear to be the critical antecedents to NOFTT in infants. The etiology and developmental course of inappropriate weight gain in NOFTT, therefore, can be attributed to situational, perinatal, child, mother, and interactive variables. A discussion of these variables will now be presented.

Variables Associated with NOFTT

Situational variables. As stated previously, NOFTT results from caloric undernutrition (Krieger, 1982). For a

variety of reasons, NOFTT infants do not ingest calories sufficient to maintain appropriate weight gain (Whitten, Pettit, & Fischhoff, 1969). Situational variables, such as family impoverishment, family stresses, maternal isolation, and lack of education, contribute to an inadequate delivery of appropriate nutrition to NOFTT infants. In fact, the prevalence of such situational variables in NOFTT families prompted Gagan, Cupoli, and Watkins (1984) to recommend the term "parental deprivation" in describing the etiology of NOFTT.

Frank, Allen, and Brown (1985) described mechanisms by which socioeconomic conditions interact with biological conditions to yield inappropriate weight gain. Specifically, they cited numerous studies that link impoverishment to inadequate diets in NOFTT infants. For example, not only are financial resources limited in low socioeconomic families, but also, emotional resources are depleted due to psychosocial stresses inherent in a condition of poverty. Economic and emotional stresses appear to decrease the likelihood that the NOFTT infant will be provided with adequate nutrition (Casey, Bradley, & Wortham, 1984).

Drotar, Nowak, Malone, Eckerle, and Negray (1985) also identified variables, such as family income, ratio of adults to children, and nutritional status at diagnosis, that influenced cognitive functioning in infants with NOFTT. Pollitt (1975) reported psychosocial stressors in families,

such as larger number of family members and density of family (i.e., children close in age), discriminated between families of NOFTT and control (i.e., normal weight) infants, thus leading him to assert, although nutritional intake is the "immediate causal antecedent, socioeconomic status is a more distal factor that may partly determine the quality and quantity of the diet that reaches the child" (p. 1596).

Although poverty appears to contribute to the availability of food and to psychosocial stress in NOFTT families, NOFTT is not limited to impoverished families. NOFTT infants may be found also in middle-class families; however, situational variables, such as lack of spouse support, marital disturbances, and inadequate social support, are almost always present in families of NOFTT infants (Bithoney & Rathbun, 1983). Kotelchuck and Newberger (1983) interviewed 42 mothers of NOFTT infants and 42 control mothers matched on age, sex, and race of the infant and family socioeconomic status. Results from discriminant function analyses indicated NOFTT families interacted less often with relatives and neighbors, had a larger discrepancy in parents' education level, and viewed their NOFTT infant as more sickly compared to control families. Mothers of NOFTT infants also reported significantly more feeding and child management problems than did control mothers. The authors may be criticized, however, for using discriminant function analysis on over 45 variables with a sample of 84 subjects.

In a study similar in design to Kotelchuck and Newberger (1983), Bithoney and Newberger (1987) interviewed 41 mothers of NOFTT infants and 41 matched-control mothers and reviewed the infants' medical record. Of 26 variables entered into a discriminant function analysis, nine significantly discriminated between groups, including infant temperament, health, developmental status, and feeding and sleep patterns; family stresses and constellation; and maternal social support and health problems. Specifically, mothers in the NOFTT group described their children as more sickly, more behaviorally difficult, and less developed in locomotive skills than matched controls. In addition, NOFTT mothers were more likely to report social isolation, fewer opportunities to escape caregiving, fewer available extended family members, and greater number of years being unmarried than were controls. NOFTT families, as compared to controls, had a greater number of children and were less likely to have an adult male in the family. These results must be viewed cautiously, however, because they were derived almost exclusively from maternal report. Given the interplay of situational and behavioral variables that may influence poor weight gain in NOFTT, Bithoney and Newberger (1987) recommended that assessments of parent-child feeding interactions be obtained concomitant with a medical work-up of the child and a psychosocial evaluation of the family.

Perinatal variables. In addition to low socioeconomic status and unsupportive social contacts, pre- and perinatal conditions are variables frequently discussed as antecedents to NOFTT. For example, birth weight of an infant or obstetric history of a mother may influence the development of NOFTT (Bithoney & Rathbun, 1983).

Full-term newborns typically weigh between 2,500 and 3,800 grams (i.e., 5.5 to 8.5 pounds). An infant's birth weight typically triples by age 12 months, but then increases by only five to six pounds during the second year (Blackman, 1984a). Low birth weight (LBW) infants weigh less than 2,500 grams at birth and appear predisposed to NOFTT and OFTT (Bithoney, 1982). LBW may occur due to prematurity (i.e., birth prior to 37 weeks gestation), in which weight is low because of incomplete development. or to intrauterine growth deficiency, in which genetic factors or unfavorable uterine environment (e.g., maternal malnutrition) result in LBW (Blackman, 1984b). An infant whose birth weight falls below the 10th percentile for gestational age is assumed to have suffered interuterine growth deficiency and is referred to as small for gestational age (SGA).

Premature and SGA infants often continue to grow poorly, due to perinatal complications (Mitchell et al., 1980) and difficulty in tolerating oral feeding, resulting in undernutrition (Blackman, 1984b). SGA infants are particularly susceptible to inadequate growth, possibly

because they have neurological deficits that contribute to disorganized motor control, labile emotional responses, and hypersensitivity to stimuli (Bithoney & Rathbun, 1983). Such behaviors in SGA infants may adversely influence feeding and non-feeding interactions between the caregiver and infant, and thus increase the chances of poor weight gain occurring due to insufficient stimulation and food intake.

Prenatal conditions, such as medical care and drugs taken during pregnancy or time since last pregnancy, may influence infant-caregiver interaction, and, thereby, contribute to undernutrition and to NOFTT (Beckwith & Cohen, 1978). For example, Hollenbeck, Gewirtz, and Sebris (1984) investigated the influence of minimal maternal medication received prepartum, during delivery, and postpartum on parent-infant interactions during the infant's first month of life. All 97 infants studied were full-term and their deliveries were without complications. Although relatively low doses of labor-delivery anesthesia and postpartum medication were prescribed to these mothers, medication adversely affected the feeding and nonfeeding interactions of fathers, mothers, and their infants during the first postpartum month. These authors avoided projecting beyond the first postpartum month; however one might speculate that perinatal medications that inhibit normal interactions this early in an infant's life might be associated with poor weight gain in NOFTT.

Child variables. In addition to situational and perinatal variables, characteristics of the child influence the occurrence of NOFTT. For example, SGA and LBW infants, often suffer from neurological deficits or defects that may result in "neonatal disorganization (reflected in poor motor and state control) and hypersensitivity to stimuli (which is reflected in his negative responses to social stimuli)" (Brazelton, 1981, p. 282). These behavioral expressions of poorly integrated central and autonomic nervous systems within the infant inhibit productive feeding and non-feeding parent-infant interactions, according to Brazelton (1981).

Although never empirically applied to the problem of NOFTT, the concept of temperament also may be pertinent to understanding the etiology of poor weight gain in infants or toddlers. Temperament has been a common variable in developmental research and is increasingly common in behavioral pediatric studies (Carey, 1982). Temperament refers to a person's behavioral style, which is believed to be consistent across time and situations, constitutionally determined, in part, and predictive of responses to stress and the development of psychological disorders. How an individual behaves, rather than the content or motivation of behavior, is conceptualized as the essence of temperament (Rutter, 1982). Temperament has been almost exclusively measured by parent-report (e.g., interview, rating scales), rather than by direct observations by researchers.

Child temperament, viewed as parents' perceptions of their child's behavioral style, has been suggested as an important mediator in the ontological course of parent-child interactions and attachment (Goldsmith & Alansky, 1987). Varying results have be obtained, however, from assessing the temperament of high-risk children, such as preterm infants. In general, researchers have reported that preterm infants do not differ from full-term infants in maternal ratings of temperament, especially by age 12 months (Ross, 1987).

With regard to non-high-risk infants, Zeanah, Keener, Anders, and Levine (1986) found no significant relationships between parent ratings of infant temperament and maternal feeding behavior in a sample 34 parents and their 6-month-old, first-born child. Infant responsiveness (e.g., looking toward, reaching toward, and smiling at parent and vocalizing), however, was correlated with one aspect of temperament (i.e., ratings of infant unpredictability).

From a sample of 200 normal infants from middle-income families, Carey (1985) found 24 infants who gained 30 or more percentile points in weight-for-length between ages 6 and 12 months and 25 infants who lost 20 or more percentile points. Based on parents' ratings of temperament, weight gainers were temperamentally difficult significantly more than weight losers and infants with a typical weight change pattern. Ratings of negative mood were determined to be a key characteristic distinguishing the weight gainers from other

infants in the sample. Weight losers did not differ from the normal weight sample in temperament ratings. The author interpreted his results by suggesting that "difficult" (i.e., fussy) infants may be fed more to quiet them.

Other authors have identified specific behaviors exhibited by NOFTT infants that contribute to parent-infant interaction problems, including feeding interactions. For example, Powell and Low (1983) observed 21 infants shortly after being admitted to a hospital for evaluation of NOFTT. The presence of eight noninterpersonal (i.e., not in proximity with a person) and six interpersonal (i.e., direct contact with a person) behaviors previously associated with NOFTT. Although not a controlled study, the research methodology included clear operational definitions of the target behaviors. Of the noninterpersonal behaviors, general inactivity was exhibited by all infants, expressionless face in 95%, and disproportionate hand and finger activity in 84%. Of the interpersonal behaviors, absent or decreased vocalization existed in all infants, indifference to separation in 95%, lack of "cuddliness" (i.e., failure to conform to the body of an adult when held enface) in 92%, and lack of response to interpersonal stimulation in 81%. Although the conclusions one can draw from this study are limited, the authors noted that the constellation of behaviors observed in this sample of NOFTT infants apparently is not associated with other infant illnesses.

As a follow-up to Powell and Low (1983), Powell and his colleagues refined their behavior categories and used them in a checklist form to evaluate the behavior of 17 NOFTT, 17 OFTT, and 33 acutely ill outpatients (Powell, Low, & Speers, 1987). Subjects were ages 3 to 24 months. Six infants were not included in the analyses because their low weight status was determined to be of "mixed" etiology. In general, the FTT children significantly differed from the acutely ill children by exhibiting more general inactivity, flexed knees and hips, expressionless face, gaze abnormality, and lack of motor activity in response to stimulation. Seven behaviors (i.e., lack of vocalization to a stimulus, lack of spontaneous vocalization, expressionless face, lack of motor activity and smile in response to a stimulus, general inactivity, and gaze abnormality) occurred significantly more often and with greater intensity in the NOFTT group than in the OFTT group. Three behaviors that were less frequent, but occurred significantly more often in NOFTT, as compared to OFTT, children were rumination, excessive thumb sucking, and disproportionate finger and hand activity. The authors suggested that these specific behaviors be assessed when children are hospitalized with poor weight gain to assist in differentiating between NOFTT and OFTT infants. It is important to note, however, that these behaviors were rated during interaction with an examiner and not with the child's primary careprovider.

Pollitt and Eichler (1976), Rosenn, Loeb, and Jura (1980), and Goldstein and Field (1985) also identified behavioral disturbances in NOFTT infants that adversely influence caregiver-infant interactions. In a comparison of NOFTT and normal growth children, Pollitt and Eichler (1976) found significantly more behavior problems (i.e., eating, sleeping, elimination, autoerotic, and self-harming behaviors) in the NOFTT group, as measured by informal home observations and interviews of the mother. The most evident difference between these groups occurred in the eating category. The NOFTT children exhibited more feeding difficulties; had skimpier, less regular meals, and responded more poorly to food. The daily caloric intake, based on mothers' 24-hour recall of infant food intake, also was lower for the NOFTT children compared to the control group. The average age for children in this study, however, was 36 months and the admission criteria included weight and height below the 3rd percentile. Based on the previous discussion of NOFTT versus PSD patients, Pollitt & Eichler's sample might have included PSD as well as NOFTT cases, and, therefore, their findings must be interpreted cautiously.

Similarly, Rosenn et al. (1980) observed NOFTT (n=8), OFTT (n=10), and hospitalized control infants (n=7) in a semistructured social interaction between infant and examiner using a 7-point Behavior Assessment Scale (Approach-Withdrawal scale). Subjects had an average age of age 8.8 months. Based

on these observations. the authors concluded that the NOFTT infants responded more positively to inanimate objects (e.g., toy) than to social interactions and appeared distressed during close social interactions (i.e., being approached or held by an adult). In contrast, the OFTT and hospital control infants responded positively to close social interactions (e.g., touching and holding). According to the authors, their sample size precluded statistical treatment of the data. The conclusions of the authors, therefore, should be viewed skeptically.

In fact, Goldstein and Field (1985) failed to replicate the findings of Rosenn et al. (1980) in a sample of 36 low socioeconomic status, hospitalized children. The twelve infants in each of the NOFTT, OFTT, and control (i.e, normal weight, acutely ill) groups were between 3 and 16 months of age. Infants were evaluated using the Behavioral Assessment Scale at the beginning, middle, and end of their hospitalization. Responsivity to proximal stimulation remained constant during hospitalization, but responsivity to distal stimulation increased for all groups. A statistically greater change in distal behavior occurred for the NOFTT and OFTT groups as compared to the control group. Goldstein and Field (1985) suggested that increases in positive affect to proximal stimulation found in Rosenn et al. (1980) may have been resulted from an "intervention" effect of the assessment itself. For example, the examiners in Rosenn et al. (1980)

became familiar to subjects and served as a source of stimulation due to the frequency of evaluations (i.e., three times daily). A positive correlation found by Goldstein and Field (1985) between positive affect at the mid-point assessment and weight at discharge for the FTT groups, however, suggested a transactional relationship between weight gain and infant behavior in underweight infants. In contrast, positive affect at the first assessment was associated with weight loss in the FTT groups, which prompted the authors to recommend careful monitoring and additional medical and behavioral assessments of FTT infants. An important evaluation to include would be direct observations of parent-infant interactions during mealtimes.

Parent variables. In addition to child variables, parental characteristics have been associated with NOFTT. In fact, NOFTT has long been considered a disorder of parenting (Derivan, 1982), and many authors have referred to NOFTT as a "maternal deprivation syndrome". Fischhoff, Whitten, and Pettit's (1971) study, although uncontrolled, identified "psychiatric pathology" (e.g., concrete thinking, poor daily functioning) in most of a small sample of mothers with NOFTT infants. In contrast, Pollitt, Eichler, and Chan (1975) failed to identify significant differences between mothers of NOFTT and normal growth children (n=38) on overt psychopathology, based on informal observations and interviews of the mothers. The authors, however, did find that their

sample of NOFTT mothers interacted less often, were more likely to use physical punishment, and were less affectionate with their children compared to control mothers matched for infant age, sex, and race. Because children ages 12 to 60 months whose weight- and height-for-age were below the 3rd percentile were sampled in this study, however, the phenomenon observed by Pollitt et al. (1975) may differ from how NOFTT is defined in the current literature review.

Maternal affect, such as depression, may contribute to the development of NOFTT. For example, Field (1984a) used Beck Depression Inventory scores to identify depressed and non-depressed mothers postpartum. According to the author, observations of mother-infant interactions when the infant was three months old indicated that the infants detected their mothers' affect (e.g., depressed mothers exhibited fewer positive facial expressions, vocalizations, and stimulatory behaviors, and more negative facial expressions) and modified their affective displays accordingly (e.g., distressed behaviors).

In addition to depression, maternal anxiety may result in feeding difficulties in breast fed infants if anxiety inhibits the mother's neurohumoral let-down reflex, thus reducing milk secretion (Gagan et al., 1984). In turn, the infant might develop an improper sucking response if the mother's anxiety-related problems are perceived (Leonard, Rhymes, & Solnit, 1966).

With regard to the less-severe end of the spectrum of maternal characteristics, Evler (1982) remarked that lack of parenting skills (e.g., knowledge of child development and behavior, poor mothering model as a child) frequently contribute to the etiology of NOFTT. In addition, Green (1984) suggested that the following deficits are commonly exhibited by mothers of NOFTT infants.

1. Inability to comfort infant.
2. Inability to provide developmentally appropriate environmental stimuli.
3. Overstimulation of baby.
4. Maternal responses not contingent upon or reciprocal with infant's needs or states; misreading or missing of infant's signals.
5. Care given mechanically and impersonally without positive interaction.
6. Failure to look or smile at, talk to, reach out for, hug, or caress infant; withdrawn, aloof demeanor.
7. Overly anxious or overprotective maternal behaviors.
8. Mother's response limited to one modality (feeding, swinging) regardless of infant's immediate need (p. 242).

Clearly, these maternal behaviors decrease the chances of appropriate delivery of nutrition sufficient for normal weight gain in infants. However, none of the studies cited in this section on parent variables associated with NOFTT were well-designed empirical studies and none measured parent behaviors during feeding interactions.

Interactive variables. The situational, perinatal, child or parent variables discussed previously do not act in isolation to cause NOFTT. Rather, these variables interact to create a sequela of extremely poor weight gain (Reinhart,

1987). Furthermore, Kotelchuck (1980) observed that in NOFTT, child and parent characteristics often converge to produce dysfunctional interactions, particularly food-related interactions, that lead to weight gain failure in infants. In addition, behaviors of infants and caregivers interact with situational and perinatal variables, to influence the quality and quantity of food intake in NOFTT young children (Brazelton, 1981; Casey, 1983).

A common thread running throughout the NOFTT literature is the assumption that feeding disturbances are associated with poor weight gain (Bell & Woolston, 1985). "Although one might speculate about various environmental factors adversely affecting growth, it is almost certain that they all act by altering food intake or utilization or both" (Baertl, Adrianzen, & Graham, 1976, p. 36). Studies of NOFTT infants have consistently shown that psychosocial variables, caregiver behaviors and child behaviors interact to create feeding difficulties in NOFTT infants (e.g., Bithoney, 1982). A few researchers have investigated feeding interactions in "normal" infants (Pollitt, Gilmore, & Valcarcel, 1978; Pollitt & Wirtz, 1981) or have studied interactional problems in NOFTT by observing play behavior of mother-infant dyads (Alfasi, 1982). Only <u>one</u> study exists, however, in which specific behaviors were coded from observations of NOFTT infants and their mothers interacting during mealtimes (Vietze et al., 1980).

Pollitt and Wirtz (1981) assumed that problematic parent-infant feeding interactions are associated with a "lack of synchrony" between the infant and caregiver when they observed 30 mother-infant dyads in a feeding interaction. Poor synchrony (i.e., infants unskilled at giving appropriate cues to parents and/or parents misreading or responding inappropriately to cues from infants) during feeding interactions place the infant at risk for NOFTT in this model. The authors hypothesized that infant weight gain at one month of age would vary as a function of mother-infant synchrony (i.e., the way they handled the bottle and responded to each other). This hypothesis was confirmed because the observed mother and infant feeding behaviors covaried with infant weight in the first month of life. For example infants who tended to be underweight and underfed were those who cried or whimpered and those whose mothers frequently removed the nipple from the infant's mouth or frequently rotated or tilted the bottle. One should be cautious in applying these results to NOFTT infants and their mothers, however, because the infants sampled in this study were not yet exhibiting poor weight gain enough to be labeled FTT.

Based on research indicating that infant behavior and the quality of parent-child interactions are related to postnatal weight gain (Pollitt, Gilmore, & Valcarcel, 1978), Mullen, Coll, Vohr, Muriel, and Oh (1988) assessed the feeding behavior of 30 mother-infant dyads. Fifteen infants who were

small for gestational age (SGA) and 15 who were appropriate for gestational age (AGA) were matched on relevant variables, such as gestational age (all were full-term), sex, neonatal risk factors, and maternal age, parity, socioeconomic status, and race. All infants were bottle fed. Behavioral rating scales and qualitative rating scales were used by "blind" research assistants to evaluate the first 10 minutes of a mother-infant feeding interaction on the second or third day of the infant's life. In addition, caloric intake was measured.

Compared to the AGA group, mothers of SGA infants had a significantly higher frequency of behaviors associated with feeding problems, and SGA infants grimaced more often. On the qualitative ratings, mothers of SGA infants were less appropriate in their initiation of interactions and determination of the amount of food to be fed and the end of feeding. SGA infants received lower ratings than their AGA counterparts on ease of feeding, degree of withdrawal/responsiveness, degree of tension/relaxation, and total qualitative rating. Furthermore, infant qualitative ratings for all subjects, and SGA infant behavior and qualitative ratings, were significantly correlated with caloric intake. Although the SGA and AGA infants did not differ in caloric intake, the authors suggested the significant correlational and group-difference results indicated that dysfunctional mother-infant feeding

interactions may contribute to the postnatal growth deficit common in SGA children. A similar evaluation of feeding interactions between parents and underweight infants or toddlers later in the child's developmental course would enhance the findings reported by Mullen et al. (1988) for newborns.

Alfasi (1982) described poor interactional synchrony in the play behavior of a NOFTT infant and his mother and compared this mother-infant dyad to a group of normal weight infants and their mothers. According to the author, the NOFTT infant in this study exhibited deficits in his ability to titrate incoming stimulation, and the mother, misreading her son's cues, responded with intrusive overstimulation. Alfasi suggested that this infant's weight gain failure developed from such asynchronous and unpleasant reciprocal exchanges, but his results are tentative since only one NOFTT mother-infant dyad was sampled. Furthermore, no mealtime interactions were observed in this study.

Using a sample of NOFTT infants (n=38), Finlon et al. (1985) observed parent-infant interactions across a wide variety of activities in the home, starting one month after the infant was hospitalized for medical treatment of NOFTT and continuing over a 10 month period. In addition to other findings, the authors reported that vocalizations between mother and child were predictive of subsequent receptive language and Bayley Mental Development Indices of the infant

at 24 months. These results must be considered preliminary, however, because the statistical analyses used by the authors (e.g., factor analyses, discriminant function analyses) were inappropriate, given the study's sample size.

The only study in which observations were made of mealtime interactions between infants subsequently diagnosed as NOFTT and their mothers was conducted by Vietze et al. (1980). Demographic variables, maternal characteristics prior to birth, infant developmental status at birth, and mother-infant interactions during a scheduled feeding session prior to discharge from the hospital were assessed in this prospective study of a sample of 498 mother-infant dyads. The results are based on data from 35 mother-infant dyads in which the infant was later identified as NOFTT.

NOFTT infants had significantly lower birthweights and shorter gestational ages relative to other infants in the research project. With regard to feeding interactions, mothers of the NOFTT infants spent less time visually attending to their newborns during mealtime than did the other mothers in the project. Although the prospective design of Vietze et al. (1980) is exemplary, mother-infant observations were not obtained at the time infants were identified as NOFTT. Observations of mother-infant dyads interacting during mealtimes shortly after the infant is admitted to the hospital for an evaluation of FTT would provide valuable information

about feeding problems associated with poor weight gain and would offer specific behavioral targets for intervention.

Models for NOFTT .

In this section, models for conceptualizing NOFTT will be presented. Generally, these models are derived from the literature on NOFTT and normal child development, but have not been empirically validated. A feeding interaction model, which is based on a behavioral analytic approach to NOFTT, will be offered as an alternative to other more global models.

Transactional and synergistic models. In an effort to integrate the plethora of variables associated with NOFTT, Casey (1983) and Brazelton (1981) have offered two explanatory models. Based on research that indicates NOFTT is a function of the inadequacy of parent-child interactions, Casey (1983) called for a reconceptualization of NOFTT. He believes that NOFTT might be best labeled "interactional FTT", because it typically involves an infant, who is deficient in eliciting appropriate attention and care, and a caregiver, who is incapable of perceiving and meeting the infant's needs. Casey postulates, "the parent-infant pair should be viewed as a psychobiological system characterized by an ongoing process of mutual feedback and adaptation. Overt or subtle problems on either side of this system can result in failure to thrive by producing a maladaptive parent-child interaction" (p. 64).

Casey's "transactional" model assumes the development of

NOFTT is based on the pathophysiologic process that exists in the interaction of infant, parent, and environment.

> The transactional model ascribes developmental outcomes over time to multiple interactions and mutual adaptations between child and the environment. Both child and environment mutually impact on the developmental outcome...If adaptation does not occur, the inadequate transaction between child and environment over time may result in long-term abnormalities in growth and development. (pp. 64-65)

In contrast, a "synergistic" model, as described by Brazelton (1981), delineates the processes by which biological and environmental variables interact to cause conditions, such as NOFTT. In this model, maternal diet, prenatal care/health, and genetic characteristics of the neonate determine the intrauterine environment. A poor intrauterine environment results in a malnourished newborn, who exhibits poor eliciting behaviors. Such ineffectual eliciting behaviors interact with behaviors of a nutritionally depleted caregiver to influence postnatal undernutrition. Poverty and environmental stress exacerbate the problem of undernutrition and also influence maternal health. Maternal health care and reproductive history influence the frequency of pregnancies. Frequent pregnancies, in turn, are associated with a poor intrauterine environment and environmental stress, thus perpetuating NOFTT risk factors to subsequent births.

The transactional (Casey, 1983) and synergistic (Brazelton, 1981) models complement one another. The synergistic model describes the occurrence of NOFTT by

identifying prenatal, situational (e.g., poverty, stress), and maternal health variables that are setting events for NOFTT. The transactional model emphasizes the interaction of environmental, parent, and infant variables in the development of NOFTT. No research to date, however, has been able to adequately test such models, and they are not molecular enough to identify specific behavioral variables associated with poor weight gain that may be easily targeted for intervention.

Behavior analytic model. In NOFTT, situational, perinatal, child, parent, and interactive (i.e., between infant and parent) variables converge to produce dysfunctional parent-infant interactions, particularly food-related interactions (Bithoney & Dubowitz, 1985). Few models for explaining NOFTT, however, emphasize specific variables that may influence conflictual or ineffective mealtime interactions. A model for NOFTT in which feeding interaction variables are identified so that clear targets for intervention emerge, however, may be drawn from Linscheid and Rasnake (1985).

Linscheid and Rasnake (1985) described parent-infant interactions as being reciprocal or bidirectional. In addition, the authors suggested parent behavior may be differentially reinforced by infant behavior and proposed two types of NOFTT: (a) Type I NOFTT, a multi-situational attachment problem, which typically occurs in infants younger than eight months old; and (b) Type II NOFTT, a feeding

interaction problem, usually beginning in infants eight months or older.

With regard to Type I NOFTT, infant stimulation in the form of nurturing interactions between parent and infant (e.g., bathing, feeding, playing) provides the infant with opportunities for learning his or her behavior influences the environment. Such "contingency experiences" allow the parent and infant to develop a communication system in which behavioral cues of the infant elicit appropriate caregiving behaviors from the parent. If infant stimulation is inadequate, a lack of contingency experiences may lead to dysfunctional parent-infant interactions across multiple situations. In turn, the stressed parent-infant relationship and insufficient caloric intake due to ineffective feeding interactions may result in poor weight gain in the NOFTT infant.

In Type II NOFTT, maladaptive behaviors, such as food refusal by an infant or ineffective delivery of food by a parent, lead to conflictual mealtime interactions and, therefore, to decreased food intake by the child. Food intake that is inadequate for proper weight gain may result, over time, in NOFTT. Linscheid & Rasnake (1985) assumed an infant's motivation for adult attention may be stronger than motivation for food (especially in older infants and toddlers in whom appetite is more variable) and stressful feeding interactions may cause anxiety or fears for parent and child.

Given these assumptions, Linscheid and Rasnake (1985) generated classical conditioning and operant models for feeding interaction problems in NOFTT. These models are displayed in Figure 1. In the classical conditioning model, parental emotional arousal is the unconditioned stimulus that elicits anxiety in the infant. By repeated pairings of food presentation (i.e., the conditioned stimulus) with parental anxiety, food presentation comes to elicit anxiety in the infant, which results in food refusal. In the operant model, food presentation is an antecedent event and food refusal is an infant behavior that may be followed by several consequences. Reinforcing consequences may include withdrawal of a disliked food and delivery of a preferred food, adult attention via prolonged attempts to get the infant to eat, or removal of the infant from the feeding situation.

The behavior analytic model for NOFTT offered by Linscheid and Rasnake (1985) is derived from studies of food refusal in young children conducted by the authors and their colleagues (e.g., Palmer, Thompson, & Linscheid, 1981). Research conducted by these and other authors (e.g., Iwata, Riordin, Wohl, & Finney, 1982; Riordin, Iwata, Finney, Wohl, & Stanley, 1984; Siegel, 1982) clearly has supported the application of behavioral principles to the assessment and treatment of NOFTT.

An alternative approach, however, is to view behavior analysis as a theoretical perspective that can incorporate

both biological and psychological variables (Redd & Rusch, 1985). In applying such a model to FTT, categorization of these children using various nosologies is unnecessary (e.g., OFTT, NOFTT, NOFTT-Type I and II, or mixed FTT). Obviously, this model departs from traditional approaches in which the assessment of psychological variables is viewed as a separate, albeit interactive, diagnostic tool that accompanies traditional, medical approaches. Figure 2 illustrates a conceptualization of this model that was first presented in Kelley & Drabman (in press).

As shown in Figure 2, both biological and behavioral (covert and overt) variables may serve as antecedents to or consequences of FTT. Antecedent variables can be immediate or temporally distant, in which case they are labeled setting events. According to Bijou and Baer (1978), setting events (e.g., physical and chemical, biological, and sociocultural variables) influence an interaction between individuals by altering the strengths and characteristics of stimulus and response functions involved in the interaction. With regard to NOFTT, setting events that may influence food intake in infants include the physical condition of infant (Horowitz, 1985), parental psychopathology, and psychosocial stressors, such as poverty or poor social support.

Such a behavior analytic model is idiographic and assumes that any number of variables may be functionally related to the maintenance of FTT in a given child. Furthermore,

variables relevant to the development of FTT may or may not be relevant to the maintenance of the disorder (Williamson, Prather, Kelley, & Heffer, in press). For example, when a biological condition interferes with feeding, parent-child interactions often become relatively aversive during feeding. In this instance, the child's physical problems could be viewed as setting events that alter subsequent parent-infant interactions (Kelley & Heffer, in press). A functional analysis of the problem may reveal the presence of both classically and operantly conditioned responses. For example, an analysis of feeding interactions may reveal a process by which the parent provides excessive attention to food refusal or inappropriate prompts to eat. Alternately, the interactions may be characterized by aversive exchanges of behavior between the infant and caregiver. The parent, for example, may attempt to coerce the chid into eating; in response, the child engages in crying or gagging in an attempt to escape an unpleasant situation. Problem interactions, such as those noted above, may or may not improve when setting events (e.g., a physical disorder or maternal depression) are alleviated.

Although this model is a rather dramatic departure from traditional approaches to FTT, it has numerous advantages (Heffer & Kelley, in press). For example, it is idiographic and emphasizes the specification of variables relevant to the treatment of an individual child, rather than to a group of

children. In addition, this model can serve as a heuristic to guide the assessment of psychological and biological variables relevant to the development and to the maintenance of FTT.

A behavior analytic model (Linscheid & Rasnake, 1985; Kelley & Drabman, in press), in which a functional analysis of behavior is emphasized, has not been empirically applied to NOFTT infants and their parents, but has been used to assess and treat feeding problems in young children (e.g., Heffer, Cavell, Kelley, Fishbein, & Drumm, 1985). Given the centrality of feeding interaction problems to a formulation of NOFTT, observations of mother-infant dyads interacting during mealtimes should be conducted and the resultant data used to test a behavior analytic model of NOFTT.

Purpose of the Present Study

The purpose of this study was to apply a behavior analytic model of assessment to FTT by observing parent and child behavior during mealtimes. Descriptive data (e.g., child growth parameters, temperament, and developmental status; maternal medical history and psychopathology; and demographic information) also were collected. The specific goal, however, was to identify feeding behaviors that differed in rate of occurrence in parent-child dyads in which the child was classified: (a) nonorganic failure to thrive (NOFTT) or Mixed FTT (i.e., physical and psychosocial etiology), (b) organic failure to thrive (OFTT), or (c) normal weight and hospitalized due to acute illness (control). The NOFTT-Mixed FTT and OFTT groups were chosen because they are the clinical samples of primary interest to this study. The normal weight, hospitalized group was selected to control for the effects of physical illness (e.g., decreased appetite due to physical and nutritional problems) and hospitalization on feeding interactions.

This study was the first to observe child and parent behavior during feeding interactions at the point of provisional diagnosis of FTT. By identifying specific behavioral contributants to poor weight gain early in hospitalization for FTT, expensive, and often intrusive diagnostic procedures may be avoided. More importantly perhaps, by observing behavior in this manner, the behavioral

topography and quality of feeding interactions is assessed and specific targets for intervention can be established. Based on the preceding literature review and on personal experience with food-related problems in young children, the following hypotheses were made:

1. Parents in FTT groups will display aversive, food-related verbal and physical behavior (e.g., force-feeding) more often than control parents.

2. Children in FTT groups will exhibit food refusal behavior more often, and will eat less, than control children.

3. Parents in the NOFTT-Mixed FTT group will interact (verbally and physically) with their children less often than OFTT and control parents.

4. Children in the NOFTT-Mixed FTT group will vocally interact with their parents less often than OFTT and control children.

5. Children in the NOFTT-Mixed FTT group will come from more impoverished families (i.e.,lower socioeconomic status, lower family income, younger parents, larger family size) than will OFTT and control children.

6. Children in the FTT groups not differ from control children on parent report of temperament or mood.

7. Children in the FTT groups will exhibit greater cognitive developmental delays than will control children.

8. Parents in the FTT groups will not differ from control parents with regard to self-reported psychopathology.

Method

Subjects

Participants were 31 parents and their hospitalized child. Children were between ages 4 and 30 months. Twenty parent-child dyads were recruited from pediatric admissions to local teaching hospitals with a provisional diagnosis of FTT. A control group of 11 parent-child dyads was obtained by randomly selecting young patients admitted to the hospital with an acute illness, whose weight-for-age was within normal limits. Excluded from this group were children with chronic illnesses associated with suboptimal weight gain, gastrointestinal complaints, feeding problems, or injuries suspected to have resulted from abuse or neglect. Control group children were diagnosed as having urinary tract infection (n=4), periorbital cellulitis (n=2), otitis media (n=2), pneumonia (n=1), asthma (n=1), and cervical lymphoditis (n=1). One control child with a urinary tract infection also had asthma and another also had Arnold-Chiari malformation, Type II (i.e, a form of spina bifida). One child with otitis media also had a seizure disorder.

Subject classification. Children were considered FTT if they met the following criteria: (a) admission weight-for-age (corrected for gestational age, if birth was prior to 37 weeks) was below the 5th percentile on standardized growth charts for young children (Babson & Benda, 1976; Hamill, Drizd, Johnson, Reed, & Roche, 1976) or (b) admission weight

reflected a decrease in the rate of weight gain represented by a loss of two or more major percentile categories (i.e., 95th, 90th, 75th, 50th, 25th, 10th, or 5th) on the growth chart. Parent-child dyads were excluded from the FTT groups if the child had a low weight-for-age percentile rank, but demonstrated a steady rate of weight gain (i.e., tracked his or her "own" growth curve).

Subjects were classified in the present study by a neonatologist, specializing in high-risk infancy and metabolic disorders. Following the patients' discharge from the hospital, she reviewed the medical records to confirm the appropriateness of the patients' diagnoses. Based on recommendations from Bithoney and Rathbun (1983) and Homer and Ludwig (1981), the following criteria were used to determine FTT group placement for this study:

1. NOFTT patients were those with inadequate weight-for-age relative to standardized growth charts as described previously, who demonstrated significant weight gain in the hospital in response to medical, dietary, and behavioral interventions. Medical assessments failed to demonstrate probable organic causes for the poor growth in these children.

2. OFTT patients were those with inadequate weight-for-age relative to standardized growth charts as described previously, who failed to demonstrate significant weight gain in the hospital in response to medical, dietary, and behavioral interventions. Furthermore, medical assessments identified probable organic causes for the poor growth in these children.

3. Growth failure in some FTT patients was determined to result from a "mixed" etiology. For example, some patients with organic disease demonstrated poor weight gain more than would be expected given their illness. Evidence emerged for these patients that environmental contributants also were involved in the weight gain failure. In addition, other patients with what appeared to be environmental etiologies for their poor weight gain, experienced illnesses that exacerbated growth failure.

A second pediatrician reviewed the available medical and psychosocial information for 10 (32.3%) randomly selected FTT subjects to determine inter-rater agreement. Reliability was calculated using the formula of Agreements divided by Agreements plus Disagreements multiplied by 100 and was found to be 100% (Foster, Bell-Dolan, & Burge, 1988).

In the present sample, only 20% (n=4) of the FTT children were identified as "pure" OFTT (i.e, the poor weight gain experienced by these FTT subjects was determined to result solely from organic causes). Although data for OFTT participants is presented throughout the method and results sections, statistical comparisons, were made between the control (n=11) and NOFTT-Mixed (n=16) groups.

The NOFTT-Mixed group, in which NOFTT (n=8) and Mixed FTT (n=8) parent-child dyads were collapsed, was chosen as the clinical comparison group because evidence emerged for both NOFTT and Mixed FTT patients that environmental contributants were involved in their weight gain failure. This method of group assignment was based on the premise that FTT occurs

along a continuum of interacting organic and nonorganic variables (Bithoney & Rathbun, 1983; Homer & Ludwig, 1981). Furthermore, it was assumed that both a nonorganic and a mixed etiology imply that psychosocial interventions can positively alter a child's condition.

Demographic description of subjects. Presented in Table 1 is a demographic description of the sample. Although data is provided in Table 1 for all subjects, only statistical differences between the control and the NOFTT-Mixed FTT groups were assessed using one-way ANOVA and chi-square analyses. As shown in Table 1, groups did not differ in child's age, race, and sex, parent's age and marital status, or family's socioeconomic status. Socioeconomic variables, categorized according to Hollingshead's criteria (Hollingshead, 1957; Hollingshead & Redlich, 1958; Myers & Bean, 1968), indicated that a majority of families were assigned to the lowest social position, based on parents' education and occupation. In addition, 70% or more of parents across all groups reported a total family income of $14,999 or less per year.

Family constellation variables also are provided in Table 1. Because separate one-way ANOVA procedures were used to compare groups on family constellation variables, a Bonferroni procedure recommended by Bray and Maxwell (1982) was employed to protect against family-wise Type I error rate. This procedure set alpha level at .008 (i.e., $p=.05$ divided by six comparisons equals .008). The control and NOFTT-Mixed

groups did not significantly differ in household number of adults or children, total people, age of youngest or oldest child, and ratio of adults to children.

Materials and Measures

Consent form. Parents recruited to participate in the study were asked to sign a consent form that briefly explained the study and asked for voluntary participation. Parents were assured that they could withdraw from the study at any time without affecting the medical care given to their child.

Demographic Questionnaire. Parents completed a questionnaire that asked for information with regard to parent's age, race, marital status, education, occupation, and income; ages of household members; and history of psychological or psychiatric services for the parent. The Demographic Questionnaire is presented in Appendix A.

Perinatal events information. Information with regard to the mother's medical history and pregnancy with the participating child was obtained from the medical chart and a semi-structured interview with the parent. In addition, information on the child's medical complications during his or her first month of life was gathered in a similar fashion. The Obstetric Complications Scale (OCS) and the Postnatal Complications Scale (PCS), provided in Appendices B and C, respectively, were used to guide this interview of perinatal events (Littman & Parmalee, 1978). The OCS, a 39-item scale, and the PCS, a 10-item scale, are scored by subtracting the

number of hazardous responses (i.e., events which might contribute to increased risk for poor developmental outcomes) from the total number of items. Scores on the OCS and the PCS have been found to correlate with mother and preterm infant behavior when the infants were one month old (Beckwith & Cohen, 1978) and with medical difficulties and developmental status of preterm infants at four and nine months of age (Littman & Parmalee, 1978).

In spite of some shortcomings (i.e., lack of psychometric data reported by the authors), these scales were chosen for use due to a lack of more appropriate measures. Because much of the information assessed by the OCS and the PCS was often unavailable in patients' medical records, however, the scales were used as an interview guide, rather than as a method of quantifying medical information as the authors recommended (Littman & Parmalee, 1978).

Eating habits questionnaires. The Food Intake, Eating Skills, and Eating Behavior Questionnaires developed by Krieger (1982) were used to obtain information on the child's food preferences, eating skills, feeding interactions, and other eating related variables. These questionnaires, displayed in Appendix D, were incorporated into a semi-structured parent interview and were used primarily to screen for aberrant eating patterns or feeding behavior. Information gathered in this manner was used to assist in

planning for observations of mealtime behavior (e.g., preferred foods, primary caregiver).

Current anthropometrics. The child's weight in kilograms, height in centimeters, and head circumference in centimeters were measured at hospital admission. These parameters were used to compare participants and to establish criteria for group classification. Anthropometrics were recorded on the growth chart appropriate for the child's age and sex. Weight-for-age percentile ranks were determined for all children (Hamill et al., 1979).

Assessment of child's temperament. Parental perceptions of child behavior and temperament are especially relevant to an assessment of FTT (Bithoney & Newberger, 1987). Parents, therefore, were asked to complete the 95-item, Infant Temperament Questionnaire (ITQ; Carey & McDevitt, 1978) or the 97-item, Toddler Temperament Scale (TTS; Fullard, McDevitt, & Carey, 1984), as shown in Appendix E. The ITQ and the TTS provide a caregiver's report of how easy or difficult the child is to handle across several areas of behavior, such as sleeping, feeding, bathing, and reactions to new people and situations. The ITQ was developed for children ages four to eight months, whereas, the TTS was designed for children ages 12 to 36 months. Parents of children in this study aged 10 months, 15 days or younger completed the ITQ; parents with children aged 10 months, 15 days and older completed the TTS.

Based on the scoring criteria established by Carey and his colleagues, parents' responses on either the ITQ or the TTS were used to assign children to one of five temperament diagnostic clusters: a) easy, b) difficult, c) slow-to-warm-up. d) intermediate-high, or e) intermediate-low. Diagnostic clusters differed based on parents' report of child behavioral style, which was conceptualized the ITQ and TTS authors to involve several temperament categories (i.e., activity, rhythmicity, approach/withdrawal, adaptability, intensity, and mood).

Following the 6-point Likert scale format of the ITQ and the TTS, parents were asked to report general impressions of their child's temperament. In the general impression section, parents were asked, "In general, temperament of the child is: a) about average, b) more difficult than average. c) easier than average" and, "Positive or negative mood--amount of pleasant or unpleasant behavior throughout the day: a) generally positive, b) variable, c) generally negative."

Bayley Scales of Infant Development. Children were administered the Bayley Scales of Infant Development (Bayley, 1969). The Bayley's two scales are designed to measure the developmental status of infants ages 2 to 30 months and to determine deviations from normal development. The Mental Scale assesses sensory-perceptual abilities, object constancy, memory, problem-solving skills, and vocalization or verbal communication skills. The Motor Scale measures body control,

coordination of the large muscles, and fine dexterity skills. Because the movement of many children in the study was restricted by medical equipment or procedures, only scores from the Mental Scale of the Bayley were used for analyses. Bayley standardized scores have a mean of 100 and a standard deviation of 16.

Assessment of parent psychopathology. Parents also completed the SCL-90-R (Derogatis, Rickels, & Rock, 1976), a 90-item self-report inventory with nine symptom constructs (e.g., Depression, Anxiety, Psychoticism) and three global indices of psychopathology (i.e., the Global Severity Index, the Positive Symptom Total, and the Positive Symptom-Distress Index). The three global indices of psychopathology used in analyses of group differences are T-scores with a mean of 50 and a standard deviation of 10. The SCL-90-R, provided in Appendix F, has been shown to have adequate psychometric properties and is best used as a standardized screening device to detect psychopathology in apparently normal individuals (Pauker, 1985; Payne, 1985).

Observations of mealtime behavior. Behavioral observations are especially important to an assessment of FTT because they provide information by which a functional analysis of ineffective feeding interactions can be formulated (Williamson, Kelley, Cavell, & Prather, in press). No behavior code of feeding interactions suitable for use in the present study exists in the literature, however. Therefore, a

code used to assess mealtime behaviors in a case of food refusal in a 5-year-old was adapted (Heffer & Kelley, 1983). The Feeding Interaction Code (FIC) is a modification of the Wahler, House, and Stambaugh (1976) code designed to assess parent and child behavior in home, school, and institutional settings. Definitions of behaviors coded in the FIC are provided in Appendix G.

Parent and child behaviors were coded from videotapes of mealtime interactions using a 15-second interval, continuous time sampling procedure. A digital display and tone on the videotapes cued observers at each 15-second interval change. Because behavior was coded from videotapes rather than "live" observations, observers first coded parent behavior on a coding sheet, rewound the tape, and then coded child behavior. This method of recording was designed to enhance the reliability of the coders' observations (Foster et al., 1988).

With regard to participant reactivity to being observed, it was anticipated that parent behavior may not be truly "naturalistic" due to an awareness of being videotaped. Based on previous research, however, parent behavior observed in this study was likely to have represented an inflated view of typical verbalizations and a decreased sample of typical nonverbal behavior (Field & Ignatoff, 1981). Parents' behavior, especially the behavior of low income parents, therefore, was likely to have reflected the most appropriate caregiving responses (i.e., the most socially acceptable)

within a given parent's behavioral repertoire (Field & Ignatoff, 1981).

Procedure

During hospitalization. Hospital census information and inquiries to the pediatric ward clerk were used to identify potential participants for the study. Potential participants were given a verbal description of the study and asked to volunteer by signing the consent form. Volunteers were then interviewed to obtain information assessed by the Food Intake, Eating Skills, and Eating Behavior Questionnaires (Krieger, 1982). Questions from the OCS and PCS (Littman & Parmalee, 1978) also were asked of parents. Later, the child's medical chart was studied to verify perinatal and medical information and to document the appropriate recording of growth parameters (i.e., weight, height, and head circumference) on the child's growth chart.

Parents were instructed to complete the paper and pencil measures and were encouraged to ask questions about difficult instructions or words. After completing the questionnaires, parents were again asked if they had any questions. Efforts were made to complete the child's developmental evaluation and to videotape a mid-day meal within the first three days of hospitalization. Although this was not always possible due to medical procedures required for the child, assessments were initiated early in the child's hospitalization (e.g., hospital

day for videotaping of first meal across all participants (M=3.8, SD=2.8).

Parent-child dyads were escorted to a private room for videotaping of lunchtime interactions if they shared a room with other patients. If the patient had a private room, videotaping was done in his or her room. Size of portions and type of food offered during meals were appropriate for each infant's developmental level (e.g., formula in a bottle, pureed food, solid food, liquid in a cup) and were described by the parent as typical for the child at home. Parents were instructed to proceed during the meal as they were accustomed to doing at home. Furthermore, parents were told to leave the room or call for the experimenter at the conclusion of the meal.

A video camera was located in a corner of the room, and the parent-child dyad was videotaped alone. Taping of the meal commenced when the experimenter left the room and ended when the parent determined the meal was over, as signified by leaving the room or calling for the experimenter.

Observational coding and data scoring. Two undergraduate assistants, who were blind to the hypotheses of this study and to patients' diagnoses, scored questionnaire data and coded the videotaped mealtime interactions. Identification numbers, rather than names, were used on all data to ensure confidentiality and to maintain unbiased impressions from the assistants. Questionnaire data were independently scored by

both assistants. If discrepancies in scoring occurred, the questionnaires were reviewed to identify and correct scoring errors.

The undergraduate assistants were trained to use the FIC according to the procedures described in Appendix H. Following training, each assistant was randomly assigned to be the primary observer for specific parent-child dyads. The primary observer independently coded the videotaped mealtime interactions following the same sequence used in the training phase (i.e, view without coding, code parent behavior, code child behavior).

Interobserver reliability. Reliability checks were performed on a random sample of 10 (32.3%) observations by having both assistants code a given videotape and then calculating interobserver agreement. Reliability was calculated using the occurrence-only formula of Agreements divided by Agreements plus Disagreements multiplied by 100 (Foster et al., 1988).

The means and ranges of interobserver agreement for the reliability check tapes are provided in Table 2. As shown in Table 2, the overall percent agreement (M=89.6%, range=83.0%-97.1%), as well as percent agreement for parent behavior (M=89.1%, range=84.8%-97.5%) and child behavior (M=89.6%, range=80.0%-96.6%) was acceptable. Percent agreement across observational categories was generally within acceptable limits, as well. Although percent agreement was low in

specific categories (e.g., Parent Negative Verbal Attention; Parent Positive, Food-Related Verbal Attention), the lower percentages were consistently due to low frequency of a specific observational category for a given reliability check tape.

Selection of observational categories of interest. Due to the exploratory nature of this study, a relatively large number of molecular behavior categories (see Appendix G) were developed to assess the behavioral topography and quality of mealtime interactions. In addition, several molecular behavior categories were collapsed in meaningful response classes (see Table 5).

Based on the hypotheses of this study, it was anticipated that group differences would be more likely on certain observational categories than on other categories. Specifically, differences were expected on observational categories that assessed parent aversive food-related behavior (e.g., Aversive Food-Related Instructions and Attention, Aversive Prompts to Eat, Negative Behavior over Intervals), child food refusal (e.g., Eating Behavior, Protests about Eating, Child Negative Food-Related Behavior), and general interaction of parent (e.g., All Verbal, Non-Negative Verbal, Non-Interaction, Mean Parent Behavior) and child (e.g., Social Interaction, Mean Child Behavior).

Ultimate selection of behavioral data for multivariate comparisons of groups was based on the hypotheses of this

study and on effect sizes between control and NOFTT-Mixed FTT groups on the observational categories (i.e., molecular behavior and response class categories). The effect sizes were generated using Glass's delta statistic (i.e., the mean of the experimental group minus the mean of the control group divided by the standard deviation of the control group). Effect size values represent the distance between group means in standard deviation units (Rosenthal, 1984). In this manner, observational categories that discriminated between control and NOFTT-Mixed FTT groups could be selected empirically (Foster et al., 1988).

Results

Behavioral Data

Although data for all participants is presented throughout the results section, statistical comparisons were made between only the control (n=11) and NOFTT-Mixed (n=16) groups. Analyses of the first meal videotaped for this study will be presented initially; analyses of the second videotaped meal will then follow.

Description of feeding variables from the first videotaped meal. Presented in Table 3 is a description of relevant feeding variables for the first videotaped meal. As shown in Table 3, eight of 11 (73%) control group children and 10 of 16 (63%) NOFTT-Mixed FTT children were fed solid food (e.g., pureed or table foods). One child in each comparison group was an independent solid food eater. Chi-square analyses did not identify significant differences between control and NOFTT-Mixed FTT groups on bottle-only versus solid food feeding methods.

Although videotaping of the first meal was delayed in specific cases due to necessary medical procedures, documentation of feeding interactions was initiated early in the hospitalization of all participants (i.e., hospitalization day M=3.8, SD=2.8). Furthermore, a one-way ANOVA did not reveal significant differences between control (M=4.1, SD=2.8) and NOFTT-Mixed FTT (M=3.9, SD=2.3) groups on hospitalization day of first videotaped meal. Length of meal was measured in

number of 15-second intervals during the feeding interaction. A one-way ANOVA demonstrated no significant differences between control (M=51.6, SD=32.3) and NOFTT-Mixed FTT (M=66.9, SD=30.3) groups on length of first videotaped meal.

The biological mother participated in all of the control dyads, 14 of 16 (88%) NOFTT-Mixed FTT dyads, and 2 of 4 (50%) OFTT dyads Other primary caregivers included a maternal grandmother (NOFTT-Mixed FTT) and a biological father (OFTT). Foster mothers were observed in one NOFTT and one OFTT parent-child dyad. The NOFTT-Mixed FTT foster mother and child had been together for approximately 1/2 months and the OFTT foster mother and child had been together for several months when they participated in this study.

Preliminary investigation of behavioral data from the first videotaped meal. Provided in Table 4 are the mean percent occurrence of molecular behavior categories (please refer to Appendix G), standard deviations, and effect sizes for control and NOFTT-Mixed groups from interactions during the first videotaped meal. In contrast to hypotheses with regard to parent aversive food-related behavior, trends indicated that percentages were greater for the control group on Parent Aversive Physical Prompt to Eat (PE-; M=2.46% vs. .63%), Aversive Verbal Attention (VA-; M=2.85% vs. .25%) and Aversive Physical Attention (PA-; M=2.80% vs. .96%).

In agreement with hypotheses with regard to general parent interaction, however, NOFTT-Mixed FTT parents

(M=14.55%, SD=18.54%) were more likely than control parents (M=5.16%, SD=6.68%) to not actively engage in verbal or physical interaction or not to look toward their child at the first five seconds of each 15-second interval, as indicated by the relatively large effect size (1.41) for Parent Non-Interaction (NI). The effect size (-.62) for Mean Parent Behavior also was relatively large (control M=1.83, SD=.57; NOFTT-Mixed FTT M=1.48, SD=.68). Mean behavior was calculated for each parent-child dyad by counting the respective frequencies of parent or child molecular behavior categories that occurred in the interaction and dividing the resultant values by the total number of intervals coded during the meal.

As hypothesized with regard to child behavior, the greatest difference (effect size= -.51) between control (M=23.11%, SD=27.45%) and NOFTT-Mixed FTT (M=9.25%, SD=14.42%) children was in the Social Interaction (SI) molecular beahvior category. Child Social Interaction sampled non-aversive vocal and physical contact with the parent.

To glean further information from the behavioral data, several molecular behavior categories were collapsed in meaningful response classes. Table 5 contains a calculation summary and written description for each of the response class categories that were considered pertinent to the hypotheses of this study.

The mean percent occurrence of parent response class categories, standard deviations, and effect sizes for control

and NOFTT-Mixed FTT groups are presented in Table 6. As shown in Table 6, the Non-Negative Verbal over All Verbal category achieved a relatively large effect size (-.97) between control (M=95.15%, SD=33.12%) and NOFTT-Mixed FTT (M=84.40%, SD=33.53%) parents.

Child response class data is displayed in Table 7. As shown in Table 7, the largest difference between comparison groups (effect size= -.50) was found in the Negative Food-Related over All Food-Related category, with control children (M=34.34%, SD=24.69%) exhibiting more food refusal relative to all food-related behavior (i.e., Eating Behavior and Protests about Eating) than NOFTT-Mixed FTT children (M=22.11%, SD=20.51%).

Multivariate comparisons of groups on behavioral data from the first videotaped meal. To investigate group differences on behavioral data from the first meal, a one-way MANOVA was completed using observational categories of interest with the largest effect sizes (i.e., Parent Non-Interaction, Parent Non-Negative Verbal over All Parent Verbal, Mean Parent Behavior, and Child Social Interaction) as dependent variables. Using Wilk's lambda criterion, the one-way MANOVA, however, did not demonstrate a significant effect for group, $F(4,22)=1.09$, $p < .39$, lambda=.835. Based on recommendations from Tabachnick and Fidell (1983), a test for homogeneity of variance-covariance matrices produced $F(10,2154)=2.54$, $p < .005$ for Box's M. When "sample sizes are

not equal and Box's M test leads to rejection, at $p < .001$, of the assumption of homogeneity of variance-covariance matrices, then robustness [of significance tests] is not guaranteed" (Tabachnick & Fidell, 1983, p.233).

The possibility was then investigated that covariation of the behavioral data with feeding variables accounted for the nonsignificant findings. Presented in Table 8 are correlation coefficients for child's age and feeding method (i.e., bottle-only vs. solid food) with selected behavioral data from the first meal. The observational categories in the upper portion of the table were included in the initial one-way MANOVA. Other observational categories that were relevant to the hypotheses of this study are in the lower portion of the table.

As shown in Table 8, all of the observational categories in the lower portion of the table were significantly correlated with child's age and with feeding method. In addition, Mean Parent Behavior was significantly correlated with feeding method (Spearman $r=.40$, $p < .026$), and Child Social Interaction was significantly correlated with child's age (Pearson $r=.51$, $p < .004$). The correlation between Mean Parent Behavior and child's age approached statistical significance.

To investigate group differences, with child's age and feeding method as covariates, therefore, a one-way MANCOVA was completed using observational categories selected in the

initial one-way MANOVA as dependent variables. Using Wilk's lambda criterion, the one-way MANCOVA, however, did not demonstrate a significant effect for group after statistically removing the linear effects of child's age and feeding method, $F(4,20)=.971$, $p < .46$, lambda=.837. A test for homogeneity of variance-covariance matrices produced $F(21,1693)=1.70$, $p < .025$ for Box's M.

Multiple regression procedures were then utilized to identify significant outlier cases and to remove extreme variance in the behavioral data from the first meal. Observational categories included in the initial one-way MANOVA were entered as independent variables into multiple regression equations. These procedures generated a list of 10 cases with the most extreme standardized residual values (i.e., z-scores) for each of the four observational categories.

As shown in Table 9, four subjects were identified as outliers based on standardized residual values of 2.00 or greater. The highlighted standardized residual scores presented in the upper portion of Table 9 indicate those values that were the most extreme for a given observational category. For example, subject #25 had the largest standardized residual score for Mean Parent Behavior; subjects #6 and #7 had the largest two absolute values on the standardized residual for Parent Non-Interaction. Non-highlighted values indicate that a subject's standardized

residual score was included in the list of 10 most extreme outliers for a given observational category.

Provided in the lower portion of Table 9 are selected characteristics of the four outlier cases. As shown in Table 9, outlier cases included one control and three NOFTT parent-child dyads. The ages of subjects #9 (control) and #6 (NOFTT) represented extremes, with subject #9 being the oldest and subject #6 being the second youngest child participant. Interestingly, the current weight-for-age percentile ranks for subjects #9 and #25 were atypical for their respective groups. In addition, subject #9 suffers with a form of spina bifida and, therefore, also may be conceptualized as different from other control children due to his chronic illness.

To investigate group differences, with extreme variance from outlier cases removed, a one-way MANOVA was completed using observational categories selected in the initial one-way MANOVA as dependent variables. Using Wilk's lambda criterion, the one-way MANOVA, however, did not demonstrate a significant effect for group after excluding outlier cases from analysis, $F(4,18)=.568$, $p < .69$, lambda=.888. A test for homogeneity of variance-covariance matrices produced $F(10,1770)=.68$, $p < .74$ for Box's M.

Description of data from the second videotaped meal. A videotape of parent-child interactions during a second meal was obtained on a subset of 13 participants. Although attempts were made to obtain two samples of feeding

interactions for all subjects, problems such as unavailablilty of the parent, medical procedures, or unanticipated discharge dates made attainment of this goal difficult. Due to small sample size (OFTT n=1, NOFTT-Mixed FTT n=9, and control n=3), therefore, the presentation of data from the second meal is descriptive in nature.

Feeding method and primary care provider did not change from the first to the second meal. In addition, groups were similar on length of the second meal (NOFTT-Mixed FTT M= 45.44, SD=17.14; control M=50.67, SD=23.71). The hospitalization day of the second meal also was similar for groups (NOFTT-Mixed FTT M=4.2, SD=1.5; control M=4.0, SD=0).

Displayed in Table 10 are the mean percent occurrence of molecular behavior categories, standard deviations, and effect sizes for the NOFTT-Mixed FTT and control groups from the second meal. Parent and child response class data for the second meal are provided in Tables 11 and 12, respectively. Although many large effect sizes were generated between NOFTT-Mixed FTT and control groups on observational categories for the second meal, small and uneven group sizes made multivariate comparisons inappropriate.

Exploratory analyses of the first and second meal. In exploratory analyses, Pearson correlation coefficients were generated on all observational categories and on length of meal for the 13 participants with behavioral data for both the first and second meals. The first and second meals were

significantly correlated on 18 observational categories, including Mean Parent Behavior and length of meal, with alpha levels ranging from .05 to .001. Correlations between the first and second meals "approached" significance (i.e., alpha levels ranging from .051 to .10) on five observational categories, including Child Social Interaction. However, nonsignificant correlations between the first and second meals occurred on 15 observational categories, including Parent Non-Interaction and Parent Non-Negative Verbal over All Parent Verbal. Correlation coefficients were not generated for Parent Aversive Instruction and Parent Aversive, Food-Related Attention because they were not coded as occurring in the 13 parent-child dyads with two mealtime observations.

In a final series of exploratory analyses, separate one-way ANOVAs were performed on all observational categories and on length of meal for both the first and second meals. Specifically, differences between the first and second meals for each observational category collapsed across groups were analyzed in this procedure. Significant differences were found between the first and second meal on 13 observational categories, including Child Social Interaction, with alpha levels ranging from .05 to .0001. Differences between the first and second meals "approached" significance (i.e., alpha levels ranging from .051 to .10) on three observational categories, including Parent Non-Interaction. No significant differences were demonstrated, however, between the first and

second meals on 13 observational categories, including Mean Parent Behavior and Parent Non-Negative Verbal over All Parent Verbal, and on length of meal. Analyses were not conducted on 12 observational categories due to no within group variance or too few cases.

Perinatal Variables

Provided in Table 13 is a description of key perinatal characteristics for the sample. Because separate one-way ANOVAs were used to compare groups on child's birth weight, weeks gestation at birth, and mother's age at child's birth, a Bonferroni procedure recommended by Bray and Maxwell (1982) was employed to protect against family-wise Type I error rate. This procedure set alpha level at .017 (i.e., p=.05 divided by three comparisons equals p=.017). As shown in Table 3, significant differences were found between NOFTT-Mixed FTT and control groups on child's birthweight in grams [$F(1,24)=6.90$, $p<.015$, $\eta^2=.22$]. Based on the Bonferroni criteria, however, groups did not differ statistically on weeks gestation or mother's age at child's birth.

As shown in Table 13, child's birthweight was also described as ranked data. Children born weighing 1500 grams or less (i.e., very low birthweight) or 1501 to 2500 grams (i.e., low birthweight) were compared to children whose birthweight was within normal limits (i.e., 2501 grams or more). Whereas all control group children had normal birthweights, only 55% of all FTT children were born weighing

in the normal range. Chi-square analyses revealed significant differences between NOFTT-Mixed FTT and control groups on child's birthweight in ranks [$\chi^2(1, N=26)=4.88$, $p < .03$].

As shown in Table 13, gestation at birth was also categorized as being either premature (i.e., 36 weeks or earlier) or term (i.e., 37 to 42 weeks). All control group children were born within the normal range of gestation. In contrast, 30% of all FTT children were born prior to the 37th week of gestation. Chi-square analyses revealed significant differences between NOFTT-Mixed FTT and control groups on weeks gestation in ranks [$\chi^2(1, N=26)=4.22$, $p < .04$].

Ranked data for mother's age at child's birth are also displayed in Table 13. A majority of all mothers delivered the child who participated in this study between ages 18 and 30 years. Consequently, chi-square analyses did not identify group differences on the ranked data for mother's age at child birth.

Child Variables

Current weight-for-age. As shown in Table 14, a one-way ANOVA revealed statistically significant differences between control and NOFTT-Mixed FTT groups on child's current weight-for-age percentile ranks [$F(1,24)=30.10$, $p < .0001$, $\eta^2=.55$]. For descriptive purposes, the mean weight-for-age percentile ranks and standard deviations for all subjects are displayed in Table 15.

One criteria for inclusion in a FTT group was the child's weight-for-age ranked below the 5th percentile on standardized growth charts. Children whose weight-for-age had fallen two or more major percentiles also were considered to be FTT. As shown in Table 15, NOFTT-Mixed FTT subjects' mean weight-for-age was, in fact, below the 5th percentile (M=3.7, SD=1.4). However, two NOFTT subjects had a weight-for-age slightly above the 5th percentile (i.e., 5.67 and 6.00), but were included as FTT subjects because their weight-for-age had fallen two or more major percentile ranks.

Although the mean weight-for-age percentile rank for control subjects was well above the 5th percentile, two control subjects had a weight-for-age near or below the 5th percentile (i.e., 5.16 and 4.94). In both cases, however, the weight-for-age of these control children tracked their "own" growth curve. In addition, the physicians treating these control children during their hospitalization, and the pediatricians who evaluated the medical records to assign subjects to groups, did not believe they were FTT children. One of each control and NOFTT-Mixed FTT children with atypical weight-for-age percentiles were described previously as being outliers in the analyses of behavioral data.

Temperament scales. Provided in Table 16 are the percentages of specific ITQ or TTS diagnostic clusters for all subjects. Also provided in Table 16 are parents' ratings of child temperament and child mood. Chi-square analyses did not

demonstrate significant differences between NOFTT-Mixed FTT and control groups on temperament diagnostic clusters, temperament ratings, and mood ratings.

The association of diagnostic clusters, temperament ratings, and mood ratings was assessed using Spearman correlation coefficients to assess the relation of parents' report of child temperament and mood. Unexpectedly, diagnostic clusters and temperament ratings (r=-.14), diagnostic clusters and mood ratings (r=.09), and temperament ratings and mood ratings (r=-.17) were statistically unrelated.

Bayley Scales of Infant Development-Mental Scale. Provided in Table 17 is an ANOVA source table for NOFTT-Mixed FTT and control groups on the Bayley Mental Developmental Index (MDI). As expected, the one-way ANOVA revealed statistically significant differences between NOFTT-Mixed FTT and control groups on the Bayley MDI [$F(1,25)=14.56$, $p < .0008$, $\eta^2=.38$]. For descriptive purposes, the mean Bayley MDI and standard deviations for all subjects are displayed in Table 18. Whereas, control children had a mean Bayley MDI score that approximated the 50th percentile for the Bayley standardization sample, NOFTT-Mixed FTT children's mean MDI was below the 1st percentile.

Parent Variables

The SCL-90-R was used to measure parents' self-report of psychopathology and psychological distress. Presented in

Table 19 are means and standard deviations for the three SCL-90-R global indices of psychopathology and the Grand Total, which is the total value (i.e., raw score) of all items. As shown in Table 19, the Grand Score Index (GSI), the Positive Symptom Total (PST), and the Positive Symptom-Dimension Index (PSDI) were within normal limits across subjects. As hypothesized, analyses of mean GSI, PST, and PSDI scores using a one-way MANOVA did not demonstrate significant differences between control and NOFTT-Mixed FTT groups.

Discussion

The purpose of this study was to apply a behavior analytic model of assessment to FTT by observing parent and child behavior during mealtimes. The specific goal was to identify feeding behaviors that differed in rate of occurrence in parent-child dyads in which the child was classified: (a) NOFTT or Mixed FTT, (b) OFTT, or (c) normal weight and hospitalized due to acute illness (control).

This study was the first to observe child and parent behavior during feeding interactions at the point of provisional diagnosis of FTT. Descriptive data (e.g., child growth parameters, temperament, and developmental status; maternal medical history and psychopathology; and demographic information) also were collected and analyzed.

A brief discussion with regard to the rejection or acceptance of this study's hypotheses will be presented initially. A general discussion of the present study's outcome will then follow. The discussion section will conclude with suggestions for future research.

Outcome of Hypotheses

1. Parents in both FTT groups will display aversive food-related verbal and physical behavior (e.g., force-feeding) more often than control parents.

Multivariate comparisons of the NOFTT-Mixed FTT and control groups did not support acceptance of the hypothesis that groups would significantly differ in occurrence of

aversive, food-related parent behavior. Due to small sample size, the OFTT group was not included in statistical comparisons. Trends, however, suggested that parent aversive behavior was generally infrequent across adult participants. Nonetheless, aversive instructions (I-) and food-related verbalizations (FI- and FA-) did occur, very infrequently, in only the NOFTT-Mixed group. In contrast, aversive general verbalizations and physical behavior (VA-, PA-, and Parent Negative Behavior over Intervals) and aversive physical prompts to eat (PE-) were more common in the control group than in the NOFTT-Mixed group.

2. Children in both FTT groups will exhibit food refusal behavior more often and will eat less than control children.

Multivariate comparisons of the NOFTT-Mixed FTT and control groups did not support acceptance of the hypothesis that groups would significantly differ in occurrence of child food refusal or eating behavior. Due to small sample size, the OFTT group was not included in statistical comparisons. Unexpectedly, however, control children tended to exhibit food refusal (PtE) slightly more often than NOFTT-Mixed FTT children. In fact, when food refusal was viewed in relation to all child food-related behavior (Child Negative Food-Related over All Food-Related Behavior), rather than to number of intervals coded (PtE), the difference between groups was even larger. In contrast, although food intake behavior

(E and Eating Behavior over All Behavior) was similar for both groups, control children tended to exhibit codable eating behavior slightly more often than NOFTT-Mixed FTT children. Variability in eating behavior was also greater in the control group, however.

3. Parents in the NOFTT-Mixed FTT group will interact (verbally and physically) with their children less often than OFTT and control parents.

Parent Non-Interaction (NI) and Mean Parent Behavior were used as indices of the frequency with which adult participants interacted with their child during mealtimes. NI was coded when the parent did not actively interact (i.e., verbally or physically) or look toward their child at the first five seconds of the 15-second interval. Mean Parent Behavior represented the average occurrence of all verbal or physical behavior across the mealtime interaction and, therefore, may be viewed roughly as the inverse of NI.

Although multivariate comparisons did not support acceptance of the hypothesis that NOFTT-Mixed FTT parents would interact with their child less than control parents, group differences, as measured by effect sizes, for NI and Mean Parent Behavior were among the largest obtained. Specifically, trends suggested that NOFTT-Mixed FTT parents failed to actively interact with their child and engaged in codable behavior less frequently than control parents. OFTT

parents were not included in statistical comparisons due to small sample size.

Because the FIC was weighted toward observations of verbal behavior, other possible indicators of general parent interaction during mealtimes were the verbal response class categories. Control parents tended to display more negative and non-negative verbalizations (Parent All Verbal over Intervals and Parent All Verbal over All Behavior) than NOFTT-Mixed FTT parents. In addition, preliminary investigations resulted in one of the largest effect sizes for Parent Non-Negative Verbal over All Verbal Behavior, with control parents engaging in this form of verbal behavior much more often than NOFTT-Mixed FTT parents. Furthermore, variability of Parent Non-Negative Verbal over All Verbal Behavior was much larger for NOFTT-Mixed FTT parents than for control parents.

4. Children in the NOFTT-Mixed FTT group will vocally interact with their parents less often than OFTT and control children.

Child vocal interaction was measured using the Social Interaction (SI) observational category, by which non-aversive vocal and physical behavior directed toward the parent was coded. Although multivariate comparisons did not support acceptance of the hypothesis that NOFTT-Mixed FTT children would vocally interact significantly less than control children, the effect size for SI was the largest obtained

among child behavior categories. Specifically, NOFTT-Mixed FTT children were less likely than control children to vocally or physically interact with their parent. OFTT children were not included in statistical comparisons due to small sample size.

5. Children in the NOFTT-Mixed FTT group will come from more impoverished families (i.e., lower socioeconomic status, lower family income younger parents, larger family size) than OFTT and control children.

Statistical comparisons of the control and NOFTT-Mixed FTT groups did not demonstrate significant differences on demographic variables, such as parent's age, socioeconomic status, and total annual family income. For example, both NOFTT-Mixed FTT and control parents were typically in their mid-twenties and were from generally impoverished families (i.e., lowest socioeconomic and income categories). Family constellation variables (e.g., number of children and number of people in the house) also did not achieve statistical differences between the NOFTT-Mixed FTT and control groups.

6. Children in the FTT groups will not differ from control children on parent report of child temperament or mood.

Statistical comparison of the NOFTT-Mixed FTT and control groups supported acceptance of the hypothesis that parents would not differentially rate child temperament or mood, based on ITQ or TTS diagnostic clusters and ratings. However,

whereas approximately one-fourth of all FTT children received a "difficult" diagnostic cluster score, over half of control children were assigned a "difficult" score. In addition, approximately half of both control and FTT parents rated their child's temperament as "average" and mood as "generally positive." Less than one-fourth of FTT parents and slightly more than one-fourth of control parents rated their child's temperament as "more difficult that others." Only one FTT parent and one control parent rated their child's mood as "generally negative."

7. Children in the FTT groups will exhibit greater cognitive developmental delays than will control children.

Statistical comparisons of the NOFTT-Mixed FTT and control groups supported acceptance of the hypothesis that FTT children would have significantly greater cognitive developmental delays than control children. Specifically, control children had a mean Bayley MDI score that approximated the 50th percentile for the Bayley standardization sample; NOFTT-Mixed FTT children's mean MDI was below the 1st percentile. Although OFTT children were not included in statistical comparisons due to small sample size, their mean MDI also was below the 1st percentile relative to the Bayley standardization sample.

Statements with regard to cognitive delays, however, must be qualified by noting that 30% of the FTT children sampled were born prematurely. Some reseachers and clinicians

advocate adjusting developmental scores for premature infants 12 months and younger, based on number of weeks born prior to term.

8. Parents in the FTT groups will not differ from control parents with regard to self-reported psychopathology.

Multivariate comparisons of the NOFTT-Mixed FTT and control groups on the three SCL-90-R global indices supported acceptance of the hypothesis that parents would not significantly differ on self-reported psychopathology. In fact, mean global scores of psychopathology were almost identical for control and all FTT parents.

General Discussion

Although much of the NOFTT literature points to parent-child interaction difficulties as paramount in the development of poor weight gain patterns, studies that include behavioral observations of mealtime interactions in NOFTT dyads are virtually nonexistent. Parallel findings occurred, however, in the present study and in the only previous study in which specific behaviors were coded from mealtime observations of NOFTT infants and their mothers (Vietze et al., 1980).

In a prospective study, Vietze and his colleagues found that a lack mothers' visually attending to their infant during a feeding interaction shortly after the child's birth was predictive of NOFTT later in infancy. In the present study, Parent Non-Interaction achieved the greatest discrepancy between groups. Specifically, NOFTT-Mixed FTT parents were

more likely than control parents to display a lack of active visual, verbal, or physical contact with their child during meals. In addition, NOFTT-Mixed FTT parents were generally less interactive than control parents (e.g., Mean Parent Behavior).

The interactive deficits of NOFTT-Mixed FTT parents were not unilateral, however. Relative to control children, NOFTT-Mixed FTT children also displayed less non-aversive vocal or physical behavior toward their parent (i.e., Social Interaction). Perhaps the lack of responsiveness in SGA infants sampled by Mullen et al. (1988) or the infrequent vocalizations in NOFTT children observed by Finlon et al. (1985) was a similar pattern of low-level responding found among NOFTT-Mixed FTT children in the present study.

The observational categories that were the most discrepant between groups in the present study (i.e, Parent Non-Interaction, Non-Negative Verbal over All Verbal, Mean Parent Behavior; Child Social Interaction) accentuate the reciprocity of parent-child interaction in the development of NOFTT, as emphasized by previous authors, such as Linsheid and Rasnake (1985). Furthermore, the correlation of some observational categories with child's age and feeding method, which is typically a function of child's age, implies that "types" of FTT based on child's age, as suggested by Linsheid and Rasnake (1985), may be an appropriate conceptualization. In addition, perhaps the child's developmental level should be

given greater consideration in future studies in which behavioral observations are employed with NOFTT infants and toddlers. For example, different parent and child behavior patterns during mealtimes may be identified as a function of the child's age.

Contrary to the assertions of Linsheid and Rasnake (1985), were trends in the present study for control children to display food refusal more often than NOFTT-Mixed FTT children. This unexpected trend may be accounted for by noting that control children tended to display more behavior in general, including eating, than NOFTT-Mixed FTT children. In addition, the hospital experience for some control children may be viewed as more aversive (e.g., intrusive procedures, physical illness) than for NOFTT-Mixed children, and thus increase the chances of child irritability during meals.

Of course, statements with regard to differential behavior patterns for control and NOFTT-Mixed FTT dyads in the present study must be viewed cautiously due to nonsignificant findings among multivariate comparisons of groups. A primary source for nonsignificant group differences is the relatively small sample size obtained in this study. Several logistical problems hindered efforts to recruit more subjects, however. For example, the data collection process was very labor-intensive, thus increasing the likelihood that one "weak link" (e.g., unavailable parent or unexpected discharge) in the chain of events may foil successful data gathering. In

addition, control parents were generally hesitant to participate, perhaps because they saw no direct relevance of the assessment to their child's condition. Furthermore, many parents said they did not want to be videotaped and appeared to view the lengthy assessment as intrusive.

The relatively small sample obtained in this study reduced statistical power and called into question the robustness of significance tests. For example, the Box's M test for homogeneity of variance-covariance matrices for the initial one-way MANOVA completed on behavioral data approached significant deviation from homogeneity. Although still nonsignificant, no significant deviation from homogeneity was indicated for the one-way MANOVA completed on behavioral data with outlier cases removed. Furthermore, small sample size may account for a lack of stability of behavior over time. In exploratory analyses, correlations of only approximately 50% of observational categories for the first and second meals were significant in the subset of cases for which two videotaped meals were available. In addition, approximately 50% of observational categories significantly differed between the first and second meal in cases with two videotaped meals.

Future Research

In spite of flaws described previously, this study did provide a useful methodology for future observational studies of parent-child feeding interactions in hospitalized FTT and normal weight children. Because trends in the behavioral data

generally supported this study's hypotheses, the Feeding Interaction Code (FIC) may be viewed as a workable observational system to evaluate parent and child mealtime behavior. Future research, however, should concentrate on simplifying the FIC to include only the observational categories that reliably discriminate between FTT and normal weight parent-child dyads.

The present study used effect sizes, a relatively recent statistical practice in group design research, to select behavioral data of interest for inclusion in analyses of group differences. Future observational studies could benefit by employing this empirical approach to data selection when differences between groups are to be analyzed. In addition, this study followed a trend in recent literature to avoid a dichotomous conceptualization of FTT and to view FTT along a continuum of interacting organic and nonorganic variables. More research is needed, however, to assess the viability of routinely using a classification scheme in which NOFTT and Mixed FTT parent-child dyads are combined for group comparisons.

In sum, the present study provided a foundation on which additional research on the behavioral topography and quality of feeding interactions among FTT parent-child dyads may build. Ample anecdotal information supports the notion that inadequate weight gain in FTT children is maintained, at least partially, by dysfunctional reciprocal exchanges between care

provider and child. Future studies that address the methodological and sampling issues presented in this discussion, therefore, are likely to reliably identify clinically useful behavior patterns for FTT parent-child dyads.

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Table 1

Description of Sample Demographic Characteristics

Variable	Groups		
	Control (n=11)	NOFTT-Mixed FTT (n=16)	OFTT (n=4)
Child's Age in Months			
M	13.1	11.3	9.3
SD	9.8	5.8	3.0
Child's Age in Ranks			
4 - 8 months	5/46%	6/38%	2/50%
9 - 12 months	3/27%	5/31%	1/25%
13 - 18 months	0	3/19%	1/25%
19 - 24 months	0	2/13%	0
25 - 30 months	3/27%	0	0
Race			
Black	9/82%	10/63%	1/25%
Caucasian	2/18%	6/38%	2/50%
Asian	0	0	1/25%
Child Sex			
Male	7/64%	9/56%	0
Female	4/36%	7/44%	4/100%
Parent Age in Years			
M	23.3	22.8	28.3
SD	5.6	5.8	5.3
Parent Age in Ranks			
16 - 19 years	2/18%	6/38%	0
20 - 29 years	8/73%	8/50%	3/75%
30 - 37 years	1/9%	2/13%	1/25%
Parent Marital Status			
Married	7/64%	7/44%	2/50%
Non-married	4/36%	9/56%	2/50%

Table 1 continued

Variable	Groups		
	Control (n=11)	NOFTT-Mixed FTT (n=16)	OFTT (n=4)
Parent Education			
Completed 9th grade	0	1/6%	0
Some high school	5/50%	7/44%	0
Graduated high school	2/20%	4/25%	1/25%
Some college/vo-tech	3/30%	4/25%	3/50%
Parent Occupation			
1 = highest social status	0	0	0
2	1/10%	0	0
3	0	0	0
4	1/10%	0	0
5	2/20%	1/6%	0
6	1/10%	6/38%	1/25%
7 = lowest social status	5/50%	9/56%	3/75%
Hollingshead Social Position Index			
1 = highest social position	0	0	0
2	0	0	0
3	1/10%	1/6%	0
4	3/30%	4/25%	0
5 = lowest social position	6/60%	11/67%	4/100%
Annual Household Income			
$ 4,999 or less	3/30%	9/60%	1/25%
$ 5,000 - $ 9,999	2/20%	1/7%	3/75%
$10,000 - $14,999	3/30%	1/7%	0
$15,000 - $19,999	0	0	0
$20,000 - $24,999	1/10%	3/20%	0
$25,000 - $29,999	1/10%	0	0
$30,000 - $34,999	0	1/7%	0

Table 1 continued

Variable	Groups		
	Control (n=11)	NOFTT-Mixed FTT (n=16)	OFTT (n=4)
Number of Adults in House			
M	2.2	2.3	1.5
SD	0.9	1.5	0.6
Number of Children in House			
M	2.0	3.6	2.3
SD	1.1	2.2	0.5
Number of People in House			
M	4.2	5.9	3.8
SD	1.1	2.4	1.0
Ratio of Adults to Children			
M	1.5	1.1	0.7
SD	0.9	1.1	0.2
Age in Years of Youngest Child			
M	1.3	2.1	1.0
SD	0.5	2.3	0.0
Age in Years of Oldest Child			
M	5.9	7.7	6.5
SD	5.7	6.2	7.4
Previous Psychological Services for Parent?			
Yes	0	1/6%	2/50%
No	11/100%	15/94%	2/50%
State Custody of Child in Study?			
Yes	0	2/13%	1/25%
No	11/100%	14/88%	3/75%

Note. Percentages are rounded-off to the nearest whole number.

Note. Table values for ranked data = n/%.

Table 2

Summary of Interobserver Agreement Across Observations

Category [a]	Mean Percent Agreement
PARENT BEHAVIOR	
Non-Interaction (NI)	95.3
Non-Aversive Instruction (I)	88.2
Aversive Instruction (I-)	---- [b]
Non-Aversive, Food-Related Instruction (FI)	100.0
Aversive, Food-Related Instruction (FI-)	----
Non-Aversive Prompt to Eat (PE)	96.7
Aversive Prompt to Eat (PE-)	----
Positive Verbal Attention (VA+)	80.8
Negative Verbal Attention (VA-)	75.0
Positive Physical Attention (PA+)	93.3
Negative Physical Attention (PA-)	----
Positive, Food-Related, Verbal Attention (FA+)	77.7
Negative, Food-Related Verbal Attention (FA-)	----
Neutral Comment (NC)	83.2
Food-Related Comment (FC)	88.9

Table 2 continued

Category [a]	Mean Percent Agreement
CHILD BEHAVIOR	
Compliance (C)	100.0
Opposition (O)	90.0
Eating Behavior (E)	97.8
Protest (Pt)	93.0
Protest about Eating (PtE)	94.4
Social Interaction (SI)	92.9
ALL BEHAVIOR	92.6 (range=83.0-100.0)
TOTAL PARENT BEHAVIOR	91.1 (range=80.8-100.0)
TOTAL CHILD BEHAVIOR	95.1 (range=80.0-100.0)

[a] See Appendix G for a complete description of the categories.

[b] Categories without mean and range of percent agreement were not coded as occurring in the observations used for reliability checks.

Table 3

Description of Feeding Variables for First Videotaped Meal

Variable	Groups		
	Control (n=11)	NOFTT-Mixed FTT (n=16)	OFTT (n=4)
Feeding Method			
Bottle only	3/27%	6/38%	2/50%
Solid foods	8/73%	10/63%	2/50%
Hospital Day of First Videotaped Meal			
M	4.1	3.9	2.5
SD	2.8	2.3	2.4
Length of Meal in 15-second Intervals			
M	51.6	66.9	67.5
SD	32.3	30.3	10.9

Note. Percentages are rounded-off to the nearest whole number.

Note. Table values for ranked data = n/%.

Table 4

Mean Percent Occurrence of Molecular Behavior Categories, Standard Deviations, and Effect Sizes for NOFTT-Mixed FTT and Control Groups From the First Meal

Code Category	OFTT (n=4) M	(SD)	NOFTT-Mixed FTT (n=16) M	(SD)	Control (n=11) M	(SD)	Effect Size [a]
PARENT BEHAVIOR							
NI	4.78	(3.56)	14.55	(18.54)	5.16	(6.68)	1.41 [b]
I	7.58	(8.55)	3.99	(4.88)	10.67	(18.46)	.02
I-	0		.06	(.23)	0		----
FI	4.33	(5.65)	12.31	(16.45)	10.61	(16.78)	.10
FI-	0		.56	(1.56)	0		----
PE	59.20	(6.90)	64.49	(22.70)	70.02	(24.36)	-.39
PE-	0		.63	(2.27)	2.46	(8.14)	.47
VA+	12.75	(9.26)	6.82	(10.98)	5.06	(3.88)	.45
VA-	.60	(1.20)	.25	(.69)	2.85	(8.20)	-.32
PA+	15.83	(12.41)	5.76	(8.14)	10.88	(14.99)	-.34
PA-	.60	(1.20)	.96	(2.80)	2.80	(4.86)	-.38
FA+	6.00	(5.63)	5.74	(11.64)	4.16	(5.72)	.28
FA-	0		.11	(.45)	0		----
NC	33.50	(13.45)	22.91	(18.93)	34.60	(22.90)	-.51
FC	20.43	(16.35)	24.46	(24.84)	29.47	(23.98)	-.21

Table 4 continued

Code Category	OFTT (n=4) M	(SD)	NOFTT-Mixed FTT (n=16) M	(SD)	Control (n=11) M	(SD)	Effect Size [a]
CHILD BEHAVIOR							
C	0		5.97	(7.15)	5.10	(10.76)	.08
O	1.68	(2.31)	6.14	(9.93)	6.56	(9.17)	-.05
E	45.55	(11.45)	59.86	(22.99)	57.43	(29.26)	.35
Pt	19.10	(13.70)	20.01	(20.41)	16.89	(20.55)	.15
PtE	22.05	(14.79)	17.36	(15.70)	20.88	(14.90)	-.24
SI	10.38	(9.11)	9.25	(14.42)	23.11	(27.45)	-.51 [b]
M Parent Behavior	1.65	(.59)	1.48	(.68)	1.83	(.57)	-.62 [b]
M Child Behavior	1.00	(.18)	1.24	(4.75)	1.29	(3.30)	-.02

Note. Percent occurrence of molecular behavior categories was calculated by dividing the frequency of a given behavior by the total number of intervals coded during the meal.

[a] Effect sizes were calculated using Glass's delta statistic and pertain here only to the NOFTT-Mixed FTT and control groups.

[b] Based on effect sizes, Parent Non-Interaction, Child Social Interaction, and Mean Parent Behavior were included in one-way MANOVA of the behavioral data for the first meal.

Table 5

Key to Response Class Code Categories for Behavioral Data

Category Name and Calculation Summary of Response Class Codes	Written Description
PARENT BEHAVIOR	
-Phys / # Int = PE- or PA- / Intervals	Negative Physical over Intervals
-Phys / *Phys = PE- or PA- / PE, PE-, PA, or PA-	Negative Physical over All Physical
-Verb / # Int = I-, FI-, VA-, or FA- / Intervals	Negative Verbal over Intervals
-Verb / *Verb = I-, FI-, VA-, or FA- / I, I-, FI, FI-, VA+, VA-, FA+, FA-, NC, or FC	Negative Verbal over All Verbal
-Beh / # Int = I-, FI-, PE-, VA-, PA-, or FA- / Intervals	Negative Behavior over Intervals
+Verb / # Int = I, FI, VA+, FA+, NC, or FC / Intervals	Non-Negative [a] Verbal over Intervals
+Verb / *Verb = I, FI, VA+, FA+, NC, or FC / I, I-, FI, FI-, VA+, VA-, FA+, FA-, NC, or FC	**Non-Negative [b] Verbal over All Verbal**
+FVer / # Int = FI, FA+, or FC / Intervals	Non-Negative Food-Related Verbal over Intervals
+FVer / *Verb = FI, FA+, or FC / I, I-, FI, FI-, VA+, VA-, FA+, FA-, NC, or FC	Non-Negative Food-Related Verbal over All Verbal
*Verb / # Int = I, I-, FI, FI-, VA+, VA-, FA+, FA-, NC, or FC / Intervals	All Verbal over Intervals
*Verb / *Beh = I, I-, FI, FI-, VA+, VA-, FA+, FA-, NC, or FC / I, I-, FI, FI-, PE+, PE-, VA+, VA-, PA+, PA-, FA+, FA-, NC, or FC	All Verbal over All Behavior
CHILD BEHAVIOR	
*Neg / # Int = O, Pt, or PtE / Intervals	Negative over Intervals
*Neg / *Beh = O, Pt, or PtE / C, O, Pt, E, PtE, or SI	Negative over All Behavior
+Beh / # Int = C or SI / Intervals	Non-Negative [c] over Intervals
+Beh / *Beh = C or SI / C, O, Pt, E, PtE, or SI	Non-Negative over All Behavior

Table 5 continued

Category Name and Calculation Summary of Response Class Codes	Written Description
Eat / *Beh = E / C, O, Pt, E, PtE, or SI	Eating over All Behavior
-Food / *Food = PtE / E or PtE	Negative Food-Related over All Food-Related

[a] The occurrence of any parent negative behavior (i.e., I-, FI-, PE-, VA-, or PA-) in a given interval discounted that interval as being non-negative.

[b] The only response class category included, based on effect size, in one-way MANOVA of the behavioral data for the first meal.

[c] Eating behavior (E) was not included in child non-negative code response classes.

Table 6

Mean Percent Occurrence of Parent Response Class Categories, Standard Deviations, and Effect Sizes for NOFTT-Mixed FTT and Control Groups From the First Meal

Code Category	OFTT (n=4) M	(SD)	NOFTT-Mixed FTT (n=16) M	(SD)	Control (n=11) M	(SD)	Effect Size [a]
-Phys # Int	.60	(1.20)	1.25	(3.68)	3.04	(4.92)	-.32
-Phys *Phys	.98	(1.95)	2.40	(7.66)	5.02	(10.00)	-.26
-Verb # Int	.60	(1.20)	.96	(2.52)	2.85	(8.20)	-.23
-Verb *Verb	1.73	(3.45)	1.68	(4.81)	2.96	(8.22)	-.16
-Beh # Int	1.20	(2.40)	2.21	(5.05)	5.88	(11.24)	-.33
+Verb # Int	55.55	(25.52)	46.73	(33.66)	54.68	(31.96)	-.25
+Verb *Verb	97.43	(5.15)	84.40	(33.53)	95.15	(11.12)	-.97 [b]
+FVer # Int	26.20	(22.25)	31.76	(30.36)	32.71	(28.57)	-.03
+FVer *Verb	39.45	(25.46)	50.94	(29.18)	47.23	(24.67)	.15
*Verb # Int	56.48	(24.41)	48.77	(36.05)	60.25	(35.14)	-.33
*Verb *Beh	62.60	(19.24)	53.58	(36.93)	61.41	(34.80)	-.23

Note. Percent occurrence of response class categories was

Table 6 continued

calculated by collapsing molecular behavior categories in meaningful ways and dividing the resultant response class by the total number of intervals coded during the meal (i.e., "# Int") or total (i.e., "*") number of intervals in which a relevant general class of behavior was coded (e.g., "*Phys"=total intervals in which parent physical behaviors were coded, "*Verb"=total intervals in which parent verbal behaviors were coded, "*Beh"=total intervals in which any parent behavior was coded). Please see Table 5 for a key to all response class categories.

[a] Effect sizes were calculated using Glass's delta statistic and pertain here only to the NOFTT-Mixed FTT and control groups.

[b] Based on effect size, Parent Non-Negative Verbal over Parent All Verbal was included in one-way MANOVA of the behavioral data for the first meal.

Table 7

Mean Percent Occurrence of Child Response Class Categories, Standard Deviations, and Effect Sizes for NOFTT-Mixed FTT and Control Groups From the First Meal

Code Category	OFTT (n=4) M	(SD)	NOFTT-Mixed FTT (n=16) M	(SD)	Control (n=11) M	(SD)	Effect Size [a]
*Neg / # Int	36.98	(18.17)	33.17	(24.14)	37.09	(20.14)	-.20
*Neg / *Beh	49.58	(24.42)	36.76	(23.56)	41.54	(21.24)	-.23
+Beh / # Int	10.38	(9.11)	13.83	(16.77)	26.77	(32.01)	-.40
+Beh / *Beh	13.85	(11.85)	15.18	(18.38)	30.46	(35.78)	-.43
Eat / *Beh	61.10	(15.29)	74.99	(19.09)	64.26	(31.00)	.35
-Food / *Food	38.53	(27.11)	22.11	(20.51)	34.34	(24.69)	-.50

Note. Percent occurrence of response class categories was calculated by collapsing molecular behavior categories in meaningful ways and dividing the resultant response class by the total number of intervals coded during the meal (i.e., "# Int") or total (i.e., "*") number of intervals in which a relevant general class of behavior was coded (e.g., "*Phys"=total intervals in which child physical behaviors were coded, "*Verb"=total intervals in which child verbal behaviors were coded, "*Beh"=total intervals in which any child behavior

Table 7 continued

was coded). Please see Table 5 for a key to all response class categories.

[a] Effect sizes were calculated using Glass's delta statistic and pertain here only to the NOFTT-Mixed FTT and control groups.

Table 8

Correlation Coefficients for Child's Age and Feeding Method with Selected Behavioral Data From the First Meal

Code Category	Child's Age [a]	Feeding Method [b]
Parent Non-Negative Verbal over All Parent Verbal	-.02	-.05
Parent Non-Interaction	-.05	-.29
Mean Parent Behavior	**.32 (.081)**	**.40 (.026)**
Child Social Interaction	**.51 (.004)**	.29
Parent All Verbal over Intervals	**.40 (.024)**	**.52 (.003)**
Parent Negative Behavior over Intervals	**.46 (.010)**	**.36 (.045)**
Child Non-Negative over Intervals	**.53 (.002)**	**.41 (.023)**
Child Negative Food-Related over All Child Food-Related Behavior	**.58 (.001)**	**.53 (.002)**

Note. Values in parentheses are alpha levels.

[a] Pearson coefficients used.

[b] Spearman coefficients used.

Table 9

Data Summary of Four Outlier Cases on Behavioral Data

Characteristic	Subject #6	Subject #7	Subject #9	Subject #25
Standardized Residual Scores				
Parent +Verb *Verb	**-3.98**	-0.63	-----	-----
M Parent Behavior	-1.83	1.32	-----	**2.24**
Parent NI	**-2.48**	**2.59**	-----	-----
Child SI	-----	-----	**2.79**	-1.02
Classification	NOFTT	NOFTT	Control	NOFTT
Age (years-months)	4-17	11-1	29-20	8-8
Race	Black	Black	White	White
Sex	Female	Female	Male	Female
Feeding Method	bottle	bottle	solid	solid
Length 1st Meal (15-sec. intervals)	45	17	45	35
Hospital Day of 1st Meal	6	3	6	2
Care Provider	Biol. Mother	Biol. Mother	Biol. Mother	Biol. Mother
Mother's Age	24	21	37	23
Total Number of People in House	2	8	4	3
State Custody?	no	no	no	no
Birthweight (kg.)	6.813	5.804	4.403	6.405
Weeks Gestation	40	39	39	40
Weight-for-Age Percentile Rank	3.80	4.17	4.94 [a]	5.67 [a]
Bayley MDI	50	67	82	114
Significant SCL-90-R Scores	yes [b]	no	no	no

[a] Atypical for respective group.

[b] Grand Score Index and Positive Symptom-Dimension Index.

Table 10

Mean Percent Occurrence of Molecular Behavior Categories, Standard Deviations, and Effect Sizes for NOFTT-Mixed FTT and Control Groups From the Second Meal

Code Category	OFTT (n=1)	NOFTT-Mixed FTT (n=9) M	(SD)	Control (n=3) M	(SD)	Effect Size [a]
PARENT BEHAVIOR						
NI	4.90	6.58	(7.54)	13.50	(9.17)	-.76
I	3.30	4.14	(4.39)	2.90	(3.37)	.37
I-	0	.77	(2.30)	.43	(.75)	.45
FI	1.60	17.21	(20.24)	2.30	(2.17)	6.87
FI-	0	0		.70	(1.21)	----
PE	59.00	69.54	(18.32)	66.33	(13.65)	.24
PE-	0	2.20	(5.69)	1.43	(2.48)	.31
VA+	6.60	7.11	(5.98)	1.13	(1.06)	5.64
VA-	0	.57	(1.70)	0		----
PA+	1.60	12.00	(26.20)	17.43	(14.13)	-.38
PA-	0	6.73	(17.76)	7.80	(13.51)	-.08
FA+	0	5.42	(6.69)	2.13	(3.70)	.89
FA-	0	0		.70	(1.21)	----
NC	19.70	38.26	(30.99)	8.47	(7.66)	3.89
FC	16.40	23.90	(13.67)	16.00	(18.46)	.43

Table 10 continued

Code Category	OFTT (n=1)	NOFTT-Mixed FTT (n=9) M	(SD)	Control (n=3) M	(SD)	Effect [a] Size
CHILD BEHAVIOR						
C	0	7.96	(10.25)	.87	(1.50)	4.73
O	0	7.93	(11.06)	3.43	(3.23)	1.39
E	59.00	59.51	(25.10)	65.60	(41.72)	-.15
Pt	19.70	18.43	(27.23)	14.33	(22.61)	-.62
PtE	0	18.24	(24.65)	16.70	(19.62)	.08
SI	4.90	9.62	(18.77)	9.37	(14.03)	.02
M Parent Behavior	1.10	1.88	(.82)	1.17	(2.31)	.31
M Child Behavior	.80	1.23	(.49)	1.07	(.21)	.76

Note. Percent occurrence of molecular behavior categories was calculated by dividing the frequency of a given behavior by the total number of intervals coded during the meal.

[a] Effect sizes were calculated using Glass's delta statistic and pertain here only to the NOFTT-Mixed FTT and control groups.

Table 11

Mean Percent Occurrence of Parent Response Class Categories, Standard Deviations, and Effect Sizes for NOFTT-Mixed FTT and Control Groups From the Second Meal

Code Category	OFTT (n=1)	NOFTT-Mixed FTT (n=9) M	(SD)	Control (n=3) M	(SD)	Effect Size [a]
-Phys # Int	0	8.93	(18.55)	9.23	(15.99)	-.19
-Phys *Phys	0	9.82	(19.96)	12.37	(21.42)	-.12
-Verb # Int	0	1.33	(2.68)	1.87	(2.21)	-.24
-Verb *Verb	0	1.76	(3.64)	4.27	(4.16)	-.60
-Beh # Int	0	10.27	(19.22)	11.10	(18.11)	-.05
+Verb # Int	37.70	54.88	(28.78)	19.13	(16.61)	2.15
+Verb *Verb	100.00	90.36	(18.28)	51.27	(48.14)	.81
+FVer # Int	18.00	31.14	(20.95)	12.90	(12.75)	1.43
+FVer *Verb	47.80	53.12	(28.48)	31.83	(27.66)	.77
*Verb # Int	37.70	65.36	(32.86)	26.67	(25.62)	1.51
*Verb *Beh	47.90	66.66	(33.03)	27.60	(26.23)	1.48

Note. Percent occurrence of response class categories was

Table 11 continued

calculated by collapsing molecular behavior categories in meaningful ways and dividing the resultant response class by the total number of intervals coded during the meal (i.e., "# Int") or total (i.e., "*") number of intervals in which a relevant general class of behavior was coded (e.g., "*Phys"=total intervals in which parent physical behaviors were coded, "*Verb"=total intervals in which parent verbal behaviors were coded, "*Beh"=total intervals in which any parent behavior was coded). Please see Table 5 for a key to all response class categories.

[a] Effect sizes were calculated using Glass's delta statistic and pertain here only to the NOFTT-Mixed FTT and control groups.

Table 12

Mean Percent Occurrence of Child Response Class Categories, Standard Deviations, and Effect Sizes for NOFTT-Mixed FTT and Control Groups From the Second Meal

Code Category	OFTT (n=1)	NOFTT-Mixed FTT (n=9) M (SD)	Control (n=3) M (SD)	Effect Size [a]
*Neg / # Int	19.70	36.61 (31.95)	23.87 (27.02)	.47
*Neg / *Beh	27.90	39.28 (34.30)	30.87 (36.67)	.04
+Beh / # Int	4.90	17.58 (20.58)	10.27 (13.46)	.54
+Beh / *Beh	7.00	19.39 (23.33)	13.47 (18.30)	.32
Eat / *Beh	83.70	71.78 (31.47)	71.70 (40.19)	.002
-Food / *Food	0	25.99 (33.70)	30.87 (41.70)	-.12

Note. Percent occurrence of response class categories was calculated by collapsing molecular behavior categories in meaningful ways and dividing the resultant response class by the total number of intervals coded during the meal (i.e., "# Int") or total (i.e., "*") number of intervals in which a relevant general class of behavior was coded (e.g., "*Phys"=total intervals in which child physical behaviors were coded, "*Verb"=total intervals in which child verbal behaviors were coded, "*Beh"=total intervals in which any child behavior

Table 12 continued

was coded). Please see Table 5 for a key to all response class categories.

[a] Effect sizes were calculated using Glass's delta statistic and pertain here only to the NOFTT-Mixed FTT and control groups.

Table 13

Description of Sample Perinatal Event Characteristics

Variable	Groups		
	Control (n=11)	NOFTT-Mixed FTT (n=16)	OFTT (n=4)
Child's Birthweight in Grams [a]			
M	3385	2615	2395
SD	462	847	910
Child's Birthweight in Ranks [b]			
Very Low to Low	0	6/38%	3/75%
Normal	11/100%	9/63%	1/25%
Weeks Gestation at Birth			
M	39.7	36.3	37.8
SD	1.4	4.9	4.5
Weeks Gestation in Ranks [c]			
36 weeks or less (premature)	0	5/31%	1/25%
37 - 42 weeks (term)	11/100%	11/69%	4/75%
Mother's Age at Child's Birth in Years			
M	22.4	21.8	24.0
SD	5.6	5.6	4.2
Mother's Age at Child's Birth in Ranks			
15 - 17 years	2/18%	5/31%	0
18 - 30 years	8/73%	10/63%	4/100%
31 - 35 years	1/9%	1/6%	0

Note. Percentages are rounded-off to the nearest whole number.

Note. Table values for ranked data = n/%.

[a] Control vs NOFTT-Mixed FTT: $F(1,24)=6.90$, $p<.015$, $\eta^2=.22$.

[b] Control vs. NOFTT-Mixed FTT: $\chi^2(1,N=26)=4.88$, $p<.03$.

[c] Control vs. NOFTT-Mixed FTT: $\chi^2(1,N=26)=4.22$, $p<.04$.

Table 14

ANOVA Source Table for NOFTT-Mixed FTT and Control Groups on Child's Current Weight-for-Age Percentile Rank

Source of Variation	df	SS	MS	F
Between Groups	1	140382343.8	140382343.8	30.10*
Within Groups	25	116616073.6	4664643.0	
Total	36	256998417.4		

* $p < .0001$, $\eta^2 = .55$

Table 15

Mean Current Weight-for-Age Percentile Rank and Standard Deviations for Subjects

Subjects	n	M	SD
OFTT	4	3.8	1.5
Mixed FTT	8	2.9	1.5
NOFTT	8	4.5	.8
Control	11	47.5	34.8

Note. NOFTT-Mixed FTT subjects: M=3.7 (SD=1.4).

Table 16

Description of Sample Temperament Diagnostic Clusters, Temperament Ratings, and Mood Ratings

Variable	Groups		
	Control (n=11)	NOFTT-Mixed FTT (n=15)	OFTT (n=4)
Temperament Diagnostic Cluster			
Easy	0	2/13%	1/25%
Difficult	6/55%	4/27%	1/25%
Slow-to-Warm-Up	0	4/27%	1/25%
Intermediate-High	3/27%	4/27%	1/25%
Intermediate-Low	2/18%	1/7%	0
Temperament Ratings			
Easier Than Others	2/18%	4/27%	3/67%
Average	6/55%	8/53%	1/33%
More Difficult Than Others	3/27%	3/20%	0
Mood Ratings			
Generally Positive	6/55%	6/40%	4/100%
Variable	4/36%	8/53%	0
Generally Negative	1/9%	1/7%	0

Note. Table values = n/%.

Table 17

ANOVA Source Table for NOFTT-Mixed FTT and Control Groups on the Bayley Mental Developmental Index (MDI)

Source of Variation	df	SS	MS	F
Between Groups	1	6043.32	6043.32	14.56*
Within Groups	24	9827.34	409.47	
Total	25	15870.65		

* $p < .0008$, $\eta^2 = .38$

Table 18

Mean Bayley Mental Developmental Indices and Standard Deviations for Subjects

Subjects	n	M	SD
OFTT	4	64.75	26.90
Mixed FTT	8	64.88	13.91
NOFTT	8	71.25	26.02
Control	10	99.40	19.92

Note. NOFTT-Mixed FTT subjects: M=68.63 (SD=20.42).

Note. Bayley scores have a mean of 100 and a standard deviation of 16.

Table 19

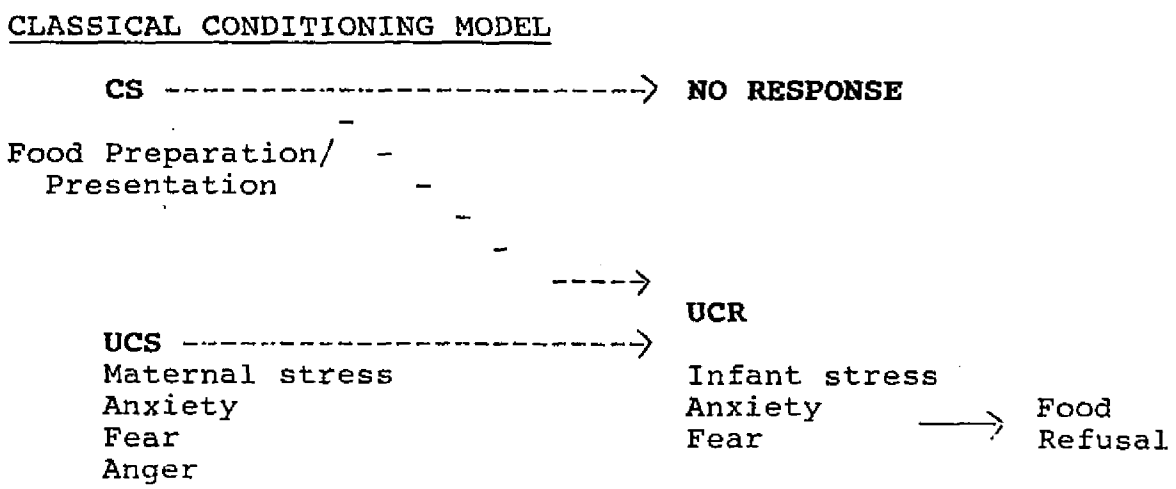
Mean SCL-90-R Global Scores and Standard Deviations for Groups

Global Score	Groups		
	Control (n=11)	NOFTT-Mixed FTT (n=15)	OFTT (n=4)
Grand Total			
M	62.9	51.5	65.5
SD	48.9	38.6	31.1
Grand Score Index			
M	58.8	54.6	62.0
SD	8.5	11.1	5.0
Positive Symptom Total			
M	56.7	54.4	63.3
SD	8.2	9.8	8.1
Positive Symptom-Dimension Index			
M	59.2	58.4	54.5
SD	9.8	7.8	7.8

Note. The Grand Total (GT) is the total value of all items endorsed. The Grand Score Index (GSI) is calculated by dividing the GT by the number of items endorsed. The Positive Symptom Total (PST) is calculated by adding the number of non-zero items endorsed (i.e., items with values of 1, 2, 3, or 4). The Positive Symptom-Dimension Index (PSDI) is calculated by dividing the GT by the PST. Raw scores for the GSI, PST, and PSDI are converted to T-scores with a mean of 50 and a standard deviation of 10. Scores of 70 or above represent significant levels of reported psychopathology for a given global score.

Figure 1

Feeding Interaction Models for NOFTT from Linscheid and Rasnake (1985)

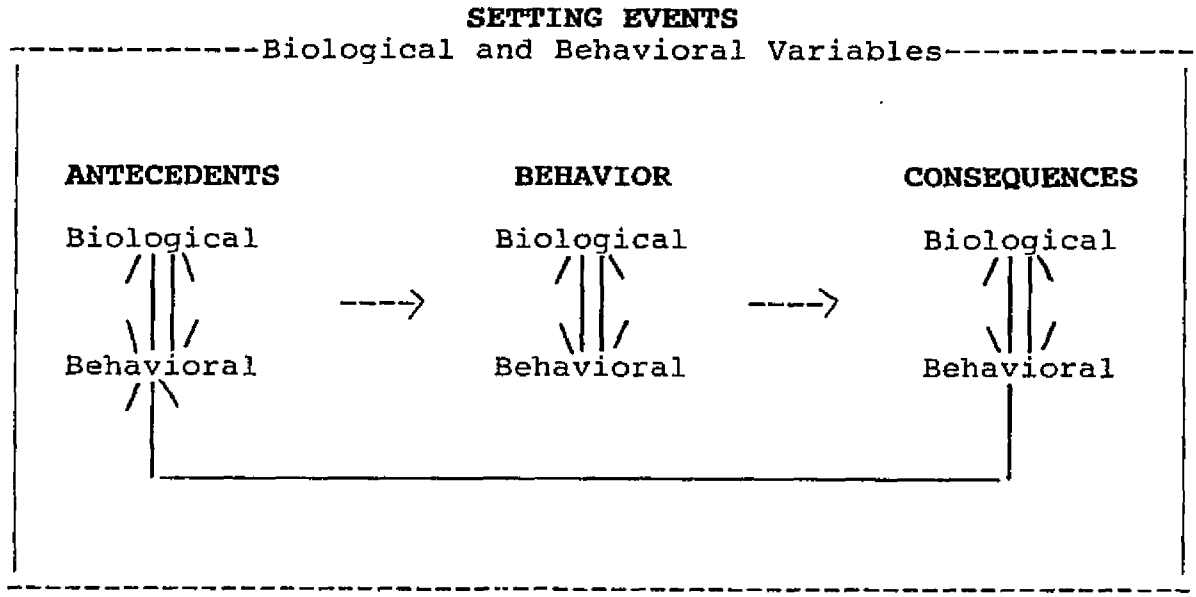


OPERANT CONDITIONING MODEL

ANTECEDENT	BEHAVIOR	CONSEQUENCE
Food Presentation---->	Food Refusal---->	Change of Food Type
Food Presentation---->	Food Refusal---->	Prolonged Attention
Food Presentation---->	Food Refusal---->	Escape From Negative Situation

Figure 2

Biological-Behavioral Model of FTT from Kelley and Drabman (in press)



Appendix A

Demographic Questionnaire

Please complete the following background information.

1. **Your Age:**

   ____ 0-19 ____ 20-25 ____ 26-30 ____ 31-35

   ____ 36-39 ____40 or above

2. **Race:**

   ____ Black ____ White ____ Hispanic ____ Asian

   _____ Other (please name it)

3. **Martial Status:**

   ____ Married ____ Single ____ Divorced/Separated

4. **Family:** Please list the ages of all those living in your house, including you and your child, and tell how they are related to you. Also, please circle the age of the head of your household.

Age	Relationship to You

Appendix A continued

5. **Education:** What is the highest level of education completed by:

Yourself	Spouse or Head of Household
____ 6th grade or less	____ 6th grade or less
____ 7th, 8th, or 9th grade	____ 7th, 8th, or 9th grade
____ some high school	____ some high school
____ graduated high school	____ graduated high school
____ some college or vo-tech school	____ some college or vo-tech school
____ graduated 4-year college/university	____ graduated 4-year college/university
____ graduated with master's or doctorate	____ graduated with master's or doctorate

6. **Occupation:** What is your occupation? _____

_____ What is the occupation of your spouse or the head of your household?_____

7. **Income:** What is the total annual income of your household? (combine the income of all the people living in your house right now)

____ $ 0-- 4,999	____ $25,000--29,999
____ $ 5,000-- 9,999	____ $30,000--34,999
____ $10,000--14,999	____ $35,000--39,999
____ $15,000--19,999	____ $40,000--49,999
____ $20,000--24,999	____ $50,000 or more

8. **Psychological Services:** Have you ever received services from a psychologist or psychiatrist?

____ yes ____ no

If you answered yes, please describe the kind of services you received. _____

_____

_____

Appendix B

Obstetric Complications Scale

	Items
1.	Gestational age (37 weeks or more)
2.	Birth weight (2.5 kg or more)
3.	Marital status (married)
4.	Maternal age (18-30 years)
5.	Previous abortions (none)
6.	Previous stillbirths (none)
7.	Prolonged unwanted sterility (no)
8.	Time since last pregnancy (less than 12 months)
9.	Parity (1-6)
10.	Pelvis (no disproportion)
11.	Blood group incompatibility (no)
12.	Bleeding during pregnancy (no)
13.	Infections/acute medical problems during pregnancy (no)
14.	Drug given during pregnancy (no)
15.	Maternal chronic disease (no)
16.	Drug abuse (no)
17.	Blood pressure during pregnancy (140/90 mm Hg)
18.	Albuminuria (no)
19.	Hyperemesis (no)
20.	Hemoglobin at delivery (less than 12 gm)
21.	Multiple birth (no)
22.	Prenatal care during first half of pregnancy (yes)
23.	Membranes ruptured prior to delivery (no)
24.	Delivery (spontaneous)
25.	Forceps (not used)
26.	Duration, first stage (3-20 hours)
27.	Duration, second stage (10-120 minutes)
28.	Onset of labor (spontaneous)
29.	Intrapartum drugs (no)
30.	Amniotic fluid (clear)
31.	Fetal presentation (vertex)
32.	Intrapartum fetal heart rate (100-160 beats per minute)
33.	Nuchal or knotted cord (no)
34.	Cord prolapse (no)
35.	Placental infarction (no)
36.	Placenta previa or abruption (no)
37.	Onset of newborn respiration within 6 minutes (yes)
38.	Apgar score, 1 minute (7-10)
39.	Apgar score, 5 minute (7-10)

Note. Positive or favorable responses are in parentheses.

Appendix C

Postnatal Complications Scale

Items
1. Respiratory distress (no)
2. Ventilation assistance (no)
3. Infection (no)
4. Noninfectious illness (e.g., anomaly, hemorrhage) (no)
5. Metabolic abnormality (no)
6. Convulsion (no)
7. Hyperbilirubinemia or exchange transfusion (no)
8. Temperature disturbance (no)
9. First feeding within 48 hours of birth (yes)
10. Surgery (no)

Note. Positive or favorable responses are in parentheses.

Appendix D

Eating Habits Questionnaires (Kreiger, 1982)

Foods Consumed

How many meals are taken per day?_____ time of day_____

How many snacks per day?_____ time of day_____

Are these schedules adhered to regularly?_____

How much milk is taken regularly per day?_____

Type of milk or formula_____

Have different milks/formulas been tried in the past?_____

Type	From - to (age)	Effect of change
_____	_____	_____
_____	_____	_____
_____	_____	_____

Is the patient's food specially prepared?_____

Describe how_____

Choice_____

Enrichment_____

Consistency_____

What foods are consumed in insufficient amounts?

_____ How much per day or week?_____

_____ How much per day or week?_____

Are foods consumed in excess and to the exclusion of others?

_____ How much per day or week?_____

_____ How much per day or week?_____

Describe a typical 24-hour food intake: Use precise measures for each food item (level table/teaspoon, 8 oz. measuring cup, 1/4, 1/2, full baby-food jar, juice glass, portions of meat cuts, etc.).

Breakfast_____

Lunch_____

Dinner_____

Snacks_____

Who feeds the child in the home?

Name	Relationship to child	Age/Sex	How often?
_____			
_____			

Appendix D continued

Eating Skills

Is your child able to:

suck?_____ swallow?_____ eat pureed food well?_____

use tongue to lick?_____ or to take food into the mouth?_____

chew?_____ or does child munch on foods, leaving most uneaten?_____

handle liquids as well as solids?_____

solids better?_____ liquids better?_____

eat finger foods?_____ drink well from a cup?_____

makes attempts, but spills a lot?_____

sit alone?_____ sit propped up?_____

spit out pureed food?_____ playfully?_____ or in temper?_____

Is it necessary to push food back into child's mouth repeatedly?_____

Is this upsetting to child?_____

Describe motor problem (if any)_____

At what age were the following foods introduced:

cereal or pureed foods?_____ finger foods?_____

fluid from a cup?_____

List age when able to go 8 hours without food or drink_____

List times of day when milk and/or other foods are fed_____

Eating Behavior

Is or does your child:

act hungry at feeding time?_____ how? cry loud?_____ act fussy?_____

demand food during the night?_____ what time?_____

use pacifier now?_____ in the past?_____ how many hours per day?_____ at bedtime only?_____

overeat?_____ favorite foods only?_____ which?_____

Appendix D continued

eat poorly?_____ picky?_____ demand foods, but not eat them?_____ gag on food?_____

act tired at mealtime?_____ get distracted during meals?_____

eat at the family table?_____ act disruptive at mealtime?_____

play with food?_____ dawdle?_____ when did it start?_____

_____

How do you handle the problem?_____

ignore it?_____ keep child at table longer?_____ how long?_____

send child away from table?_____ where to?_____

withhold dessert or favorite foods?_____ hide food from child?_____

offer different foods?_____ plead?_____ bribe?_____

Are you consistent in handling this problem?_____

Do both parents agree on handling of problem?_____

Do other family members get involved?_____ who?_____

Describe effect on siblings (if any)_____

_____

Was the child demanding for food as a small infant?_____

Appendix E

Toddler Temperament Scale and Infant Temperament Questionnaire

RATING INFORMATION

1. Please base your rating on the child's recent and current behavior (the last four to six weeks).
2. Consider only your own impressions and observations of the child.
3. Rate each question independently. Do not purposely attempt to present a consistent picture of the child.
4. Use extreme ratings where appropriate. Avoid rating only near the middle of the scale.
5. Rate each item quickly. If you cannot decide, skip the item and come back to it later.
6. Rate every item. Circle the number of any item that you are unable to answer due to lack of information or any item that does not apply to your child.

USING THE SCALE SHOWN BELOW, PLEASE MARK AN "X" IN THE SPACE THAT TELLS HOW OFTEN THE CHILD'S RECENT AND CURRENT BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED BY EACH ITEM.

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always
1	2	3	4	5	6

[Toddler Temperament Scale items]

1. The child gets sleepy at about the same time each evening (within 1/2 hour). : 1 : 2 : 3 : 4 : 5 : 6 :
2. The child fidgets during quiet activities (story telling, looking at pictures). : 1 : 2 : 3 : 4 : 5 : 6 :
3. The child takes feedings quietly with mild expression of likes and dislikes. : 1 : 2 : 3 : 4 : 5 : 6 :

.
.
.

97. The child looks up from play when the telephone or doorbell rings. : 1 : 2 : 3 : 4 : 5 : 6 :

[Infant Temperament Questionnaire items]

1. The infant eats about the same amount of solid food (within 1 oz.) from day to day. : 1 : 2 : 3 : 4 : 5 : 6 :
2. The infant is fussy on waking up and going to sleep (frowns, cries). : 1 : 2 : 3 : 4 : 5 : 6 :
3. The infant plays with a toy for under a minute and then looks for another toy or activity. : 1 : 2 : 3 : 4 : 5 : 6 :

.
.
.

95. The infant moves much and for several minutes or more when laying by self (kicking, waving arms, and bouncing). : 1 : 2 : 3 : 4 : 5 : 6 :

Appendix F

SCL-90-R Instructions and Items

INSTRUCTIONS

Below is a list of problems and complaints that people sometimes have. Read each one carefully and select one of the numbered descriptors that best describes HOW MUCH DISCOMFORT THAT PROBLEM HAS CAUSED YOU DURING THE PAST 2 WEEKS INCLUDING TODAY. Place that number in the open block to the right of the problem. Do not skip any items and print your number clearly. If you change your mind, erase your first number completely. Read the example below before beginning, and if you have any questions please ask the technician.

EXAMPLE	Descriptors
HOW MUCH WERE YOU DISTRESSED BY: Answer	0 Not at all 1 A little bit 2 Moderately 3 Quite a bit 4 Extremely
Ex. Body Aches.....Ex. | 3 |	

---

1. Headaches.....|__|
2. Nervousness or shakiness inside.....|__|
3. Repeated unpleasant thoughts that won't leave your mind.|__|
4. Faintness or dizziness.....|__|
5. Loss of sexual interest or pleasure.....|__|
6. Feeling critical of others.....|__|
7. The idea that someone else can control your thoughts....|__|
8. Feeling others are to blame for most of your troubles...|__|

.
.
.

87. The idea that something serious is wrong with your body.|__|
88. Never feeling close to another person.....|__|
89. Feelings of guilt.....|__|
90. The idea that something is wrong with your mind.....|__|

Appendix G

Definitions Used in the Feeding Interaction Code (FIC)

PARENT MOLECULAR BEHAVIORS

1. Instruction, non-aversive (I): This category is scored for non-food-related, direct commands (imperatives: e.g., "Come here!") and indirect commands sometimes expressed as questions (interrogatives: e.g., Will you come here?") directed toward the infant. Only commands that specify an act of compliance are considered to be instructions. Most questions would not be coded as instructions because they do not specify an act of compliance (e.g., "Do you want to sit on my lap?"--either yes or no could be acceptable answers). Ambiguous commands, both direct and indirect, are not scored as instructions for the same reason (e.g., "Be good" does not specify the action required). An instruction must designate an obvious referent (e.g., "Pick up your shoe") or class of referents,otherwise it is scored as verbal attention or comment. Multiple instructions can occur in any interval as long as they refer to specific acts of compliance; however, only one instruction per instruction category (i.e., I, I-, FI, or FI-) is scored on the coding sheet, and only the first instruction per instruction category is considered with respect to the scoring of compliance or opposition.

   Instances scored as I:
   a. "Please stop pulling on the curtain."
   b. "Don't take off your shoes."
   c. "Will you come here?"

   Instances not scored as I:
   a. "Be a good girl, now." (ambiguous)
   b. "Do you want to play a game after lunch?" (not a command)
   c. "Are you going to behave?" (ambiguous)

2. Instruction, aversive (I-): This category is scored in the same manner as I, but is judged aversive because of the content of the instruction, the voice quality of the parent, and/or the physical behavior of the parent.

   Aversive content:
   a. The instruction contains a threat of punishment or

unpleasant consequences to the child (e.g., "Stop that or I'll spank you!").
b. The instruction contains ridicule (e.g., "You can't do anything right--give me that.").

Aversive voice quality:
a. The instruction is spoken loudly or shouted.
b. The instruction is spoken in a "threatening" tone of voice, which may be high-pitched or low and measured/deliberate as if the speaker is exercising control.

Aversive physical behavior:
a. The instruction is given in conjunction with grabbing, spanking, pushing, striking, or pinching the child.
b. The instruction is given in conjunction with other forceful physical behavior toward the child or toward removing the objects involved in the instruction (e.g., forcefully grabbing a toy out of the child's hand).

Instances scored as I-:
I and I- may be scored in the same interval if both occur.
a. "If you throw that one more time, I'll spank you."
b. "Come here now!" [shouted]
c. "Pick up your socks." [swats child]

Instances not scored as I-:
a. "OK, now you'll be spanked." (not an instruction)
b. "That was bad!" [swats child] (not an instruction)
c. Any aversive behavior judged to be mock or playful.

3. Food-related instruction, non-aversive (FI): This category is scored in the same manner as I, but has as its subject specific foods, mealtimes, the place for eating, utensils, or eating, in general.

Instances scored as FI:
a. "Sit up to the table."
b. "Eat some of these carrots."
c. "Here, baby, take your bottle."

Instances not scored as FI:
a. "Do you want some more bread?" (yes/no response required)
b. "OK, how much more food on your plate?" (ambiguous)
c. "I like it when you eat your food." (not an instruction)

4. Food-related instruction, aversive (FI-): This category is scored in the same manner as I-, but has as its subject specific foods, mealtimes, the place for eating, utensils, or eating, in general.

   Instances scored as FI-:
   FI- and FI may be scored in the same interval if both occur.
   a. "Stop playing with your food!" [shouted]
   b. "Eat your green beans, or I'll spank you."
   c. "Stop banging the table with your spoon." [forcefully grabs spoon]

   Instances not scored as FI-:
   a. "Are you going to eat for me?" (yes/no response required)
   b. "I'm going to get you if you don't eat." (mock/playful)
   c. Parent swats child and says, "Stop yelling!" (not food-related)

5. Physical prompts to eat, nonaversive (PE): This category is scored for deliberate physical contacts made by the parent or any direct extension of the his/her body (e.g., a spoon held in the hand) that moves food to within three inches of the child's mouth. When food is placed in the child's mouth, to the child's lips, or in front of the child's mouth (three inches or less), PE is scored.

   Instances scored as PE:
   a. Parent uses his/her fingers to put food in the child's mouth.
   b. Parent uses spoon/fork to put food to the child's lips.
   c. Parent places bottle in the child's mouth.
   d. Parent puts straw [in drink] to within three inches of child's mouth.

   Instances not scored as PE:
   a. "Do you want some green beans?" (verbal, not physical)
   b. Parent eats food.
   c. Parent puts food on spoon, but does not place it within three inches of the child's mouth.

6. Physical prompts to eat, aversive (PE-): This category is scored in the same manner as PE+, but the prompt is given in conjunction with grabbing, spanking, striking, pinching, or other forceful physical behavior or in conjunction with FI-.

Instances scored as PE-:
PE- and PE may be scored in the same interval if both occur.
a. Parent shouts, "Now, eat!" and uses her fingers to put food in the child's mouth.
b. Parent grabs the child's arm and uses spoon/fork to put food to the child's lips.
c. Parent puts straw [in drink] to within three inches of child's mouth and swats the child.

Instances not scored as PE-:
a. "Why don't you ever eat?" [shouted] (verbal, not physical)
b. Parent throws food [on spoon] onto tray. (food not moved toward child's mouth)
c. Parent holds cup/glass and swats child, but does not place the cup/glass to within three inches of the child's mouth.

7. Verbal attention, positive (VA+): This category is scored for non-food-related verbalizations directed toward the infant that do not specify an act of compliance. The verbalization is accompanied by smiling or affectionate words.

Smiling: The parent smiles (broad, slight, playful, pleading) or laughs at or with the child. The smile must be directed toward the child, although the child does not have to seem aware of or respond to it. The smile must be clearly seen and the laugh must be clearly heard by the observer.

Affectionate words: The subject does one or more of the following.
a. Addresses child with an endearment (e.g., honey, dear) or a pet name (e.g., baby girl, sweetie pie).
b. Tells child that he/she likes, loves, missed, or enjoys being with him/her.
c. Compliments the child's physical appearance, personal qualities, or actions.
This category includes words of praise such as "good" or "right." Neutral words such as "OK" or "yes" are not considered praise. Polite words such as "please" or "thank you" also are not included in this category. Affectionate words must be clearly heard by the observer so that he/she is able to repeat the words.

Instances scored as VA+:
a. Parent smiles at child and says, "You're a big boy/girl."
b. "Baby boy/girl, I love you."

c. "You're a pretty baby."

Instances not scored as VA+:
a. Child obeys an instruction, and the parent says, "Thank you."
b. Child watches as the parent smiles and hums while looking away from the child.
c. "OK, honey, take a big bite." (a food-related instruction)

8. Verbal attention, aversive (VA-): This category is scored for non-food-related verbalizations directed toward the infant that do not specify an act of compliance and are judged aversive because of the content of the verbalization and/or the voice quality of the parent. This category includes negative, critical, or aversive remarks directed toward the child and negative comments given in a raised voice.

Instances scored as VA-:
VA- and VA+ may be scored in the same interval if both occur.
a. "What in the world is wrong with you now!" [shouted]
b. "You're terrible."
c. "I should knock you silly."

Instances not scored as VA-:
a. "Why don't you ever eat?" [shouted] (food-related)
b. Parent smiles and says, "I should whip you." (mock aversive)
c. "Stand up or I'll spank you." (an instruction)

9. Physical attention, positive (PA+): This category is scored for non-food-related, deliberate, physical contacts with the infant that are considered actively affectionate.

Actively affectionate: The parent hugs, cuddles, puts arm around, kisses, is in cheek to cheek contact with, tickles, pats, strokes, caresses, nuzzles, musses hair, wrestles playfully, bounces, jostles, rocks, briefly touches while dancing separately, or playfully (i.e., pretends, does gently, in jest/mock) spanks, bites, kicks or pinches the child. PA+ should be scored only if the behavior can be described by these words. They are intended to omit many types of physical contact that are not considered affectionate such as bumping into accidentally, helping get onto chair, or patting to get attention.

Instances scored as PA+:

a. Parent kisses and caresses the child.
b. Parent playfully wrestles with and bounces the child.
c. Child obeys an instruction, and the parent says, "Good job" while hugging the child.

Instances not scored as PA+:
a. Parent helps the child get onto chair. (not affectionate)
b. "I love you." (verbal, not physical)
c. Parent swats the child while scowling. (not mock/playful)

10. Physical attention, aversive (PA-): This category is scored for non-food-related, deliberate, physical contacts with the infant that are judged aversive because of the physical behavior of the parent. This includes hitting, kicking, pushing, shoving, restrictive face holding, or other negative or aversive physical contact.

Instances scored as PA-:
PA- and PA+ may be scored in the same interval if both occur.
a. Parent pushes the child.
b. Parent grabs the child's arm.
c. Parent swats the child.

Instances not scored as PA-:
a. Parent kicks the wall. (not directed toward the child)
b. Parent throws food [on spoon] onto tray. (food-related)
c. Parent shouts, "I'm going to spank you." (verbal, not physical)

11. Food-related verbal attention, positive (FA+): This category is scored for food-related verbalizations directed toward the infant that do not specify an act of compliance. The verbalization is food-related because it has as its subject specific foods, mealtimes, the place for eating, utensils, or eating, in general. The verbalization includes smiling or affectionate words as described in VA+.

Instances scored as FA+:
a. Parent smiles and says, "You're eating well."
b. "I like it when you eat green beans."
c. "You're a good baby for sitting up at the table."

Instances not scored as FA+:
a. Child obeys an instruction to come to the table, and the parent says, "Thank you." (not defined as affectionate)
b. Child eats as the parent smiles and hums while looking away from the child. (not directed toward the child)
c. "OK, honey, take a big bite." (an instruction)

12. Food-related verbal attention, aversive (FA-): This category is scored for food-related verbalizations directed toward the infant that do not specify an act of compliance and are judged aversive because of the content of the verbalization and/or the voice quality of the parent. This category includes negative, critical, or aversive remarks directed toward the child and negative comments given in a raised voice that have as the subject specific foods, mealtimes, the place for eating, utensils or eating, in general.

Instances scored as FA-:
FA- and FA+ may be scored in the same interval if both occur.
a. "Why won't you eat!" [shouted]
b. "You're a terrible eater."
c. "You've made a mess of this table."

Instances not scored as FA-:
a. "Why can't you act right?" [shouted] (non-food-related)
b. Parent smiles and says, "I should whip you for not eating." (mock aversive)
c "Sit up at the table or I'll spank you." (an instruction)

13. Neutral comment (NC): This category is scored for any neutral, non-food-related verbalization directed toward the child. The comment is considered "neutral" because it involves verbalizations that are not affectionate, not aversive, and not instructions. This category differs from NI in that the verbalization is judged to be directed toward the child based on the adult's facial orientation toward the child or the content of the comment.

Instances scored as NC:
a. Parent looks at child and says, "We're going home tomorrow."
b. Child obeys an instruction, and the parent says, "Thank you."
c. "Do you want to sit on my lap?"

d. "Be good."

Instances not scored as NC:
a. "Come here." (an instruction)
b "You're a sweet baby." (affectionate)
c. "You don't know how to behave!" (aversive)
d. Parent looks away from child and says, "What are we going to do now?" (face not oriented toward child)

14. Food-related, neutral comment (FC): This category is scored in the same manner as NC, but has as its subject specific foods, mealtimes, the place for eating, utensils, or eating, in general.

Instances scored as FC:
a. Parent looks at child and says, "Look at those green beans."
b. "What's for lunch, baby?"
c. "Do you want to drink some milk?"
d. Child asks, "Do I have to eat this?", and parent says, "Yes/no."

Instances not scored as FC:
a. "Eat your green beans." (an instruction)
b. "You're sitting at the table very well." (affectionate)
c. "You never eat anything!" (aversive)
d. Parent looks away from child and says, "When will you eat?" (face not oriented toward child)

15. Non-interaction (NI): This category is scored when the parent is not actively interacting with the child in the first five seconds of the 15-second interval. The parent may be passively interacting by holding the child or even feeding the child (e.g., holding bottle), but is not looking at, speaking to, or actively touching the child (i.e., bodies only in passive contact such as when child is sitting in parent's lap). The interaction is not affectionate, not aversive, and not actively physical. Verbalizations may occur, but are not directed toward the child.

Instances scored as NI:
a. Parent has the child in his/her lap and stares forward.
b. Parent holds bottle in the child's mouth and hums to him/herself.
c. "I need to talk to the doctor after lunch." [said to self]

Instances not scored as NI:
a. Parent is silent, but looks at child. (visually attending to child)
b. Parent holds bottle in the child's mouth, and gently rocks the child. (affectionate, physical contact)
c. Parent looks away from child and is silent, but swats the child. (aversive, physical contact)

CHILD MOLECULAR BEHAVIORS

1. Compliance (C): This category is scored for any instance of compliance with an instruction within three seconds from delivery of the instruction. Instructions specify a discrete act (e.g., "Bring me the spoon."). Compliance with in-setting rules (e.g., not turning over tray) is not scored as C, unless that rule is stated to the child as an instruction.

   Instances scored as C:
   a. Child points to his/her nose after being asked to do so.
   b. Parent tells child to pick up a spoon. After several intervals of ignoring (score O) and no further instructions from the parent or setting changes, he/she does so. (score C)
   c. Parent tells child to stop playing with his napkin. He/she does so for three seconds, then starts again. (minimum compliance)

   Instances not scored as C:
   a. Parent says, "Be good", and child does not misbehave. (no discrete instruction given)
   b. Child obeys four or more seconds after instruction is given. (score O, then C when compliance occurs
   c. Parent says, "Eat your corn", and child takes a drink.

2. Opposition (O): This category is scored for noncompliance with instructions after four or more seconds from delivery of the instruction. It is scored in the first interval of noncompliance and is scored for each subsequent interval of sustained noncompliance until a) the child complies with the instruction, b) a new instruction is given, c) or a setting change occurs (i.e., an event that nullifies the instruction, making it impossible for the child to comply or noncomply).

Instances scored as O:
a. Child ignores parent's instruction to stop playing and come to the table. (score O in the first interval and in subsequent intervals in which noncompliance occurs at the beginning of or throughout the interval)
b. Child ignores instruction for four seconds, then complies. (score O, then C when compliance is observed)
c. Child continues to scream after being instructed to stop.

Instances not scored as O:
a. Child obeys an instruction within three seconds.
b. Parent says, "Pick up your spoon", and after a brief (i.e., three seconds or less) period of noncompliance, the parent picks up the spoon. (setting change nullifies instruction)
c. Mother says, "Do you want to come here?", and child says, "No." (no instruction given)
d. Parent says, "Stop playing with your napkin", (score O if noncompliance occurs) and then says, "Hand me your cup." (discontinue scoring with regard to first instruction)

3. Eating behavior (E): This category is scored for food intake behavior, such as biting, chewing, swallowing, drinking, or putting food into the mouth. The child may accept food or liquid from the parent or may feed him- or herself. E is scored when food or liquid is accepted into the mouth and is scored in successive intervals in which chewing or swallowing of the food or liquid occurs.

Instances scored as E:
a. Child accepts food from parent by closing his/her lips around the food and taking it into his/her mouth.
b. Child accepts straw into his/her mouth and draws liquid through the straw in his/her mouth.
c. Child touches cup/milk carton to his/her lips and drinks liquid.

Instances not scored as E:
a. Child lets food touch his/her mouth, but does not take it into his/her mouth.
b. Child allows liquid to touch his/her lips, but lets it dribble down his/her chin rather than drinking it.

4. Protests (Pt): This category is scored for any physical or verbal protests made by the child. Verbal protests include whining, crying, intelligible vocal complaints, or aversive statements. Aversive in this context is defined the same as in the I-category. Physical protests include physical gestures (e.g., hitting, pushing, kicking, biting, pinching, or throwing objects) directed toward the mother, or displays of temper.

   Instances scored as Pt:
   a. Child whines, "I don't want to."
   b. Child has temper tantrum by kicking the floor and screaming.
   c. Child says to parent, "You're mean; I hate you."

   Instances not scored as Pt:
   a. Child pushes at parent in jest.
   b. Child says [while smiling], "You're mean." (mock)
   c. Child hits self.

5. Protests about eating (PtE): This category is scored in the same manner as Pt, but has as its subject specific foods, mealtimes, the place for eating, utensils, or eating, in general. In addition, this category is scored if the infant does not accept food within three seconds from the time it is offered by the mother (i.e., food-related instruction or physical prompt to eat) or pushes the food away.

   Instances scored as PtE:
   a. Child turns head away from food being offered.
   b. Child spits out food placed in his/her mouth or food he/she has been eating. (score E for food intake and then PtE if that food is subsequently expelled)
   c. Parent says, "Eat", and child says, "No" or shakes his/her head indicating a "no" response.
   d. Child says, "I hate green beans!"

   Instances not scored as PtE:
   a. Child coughs/sneezes and food is expelled from his/her mouth.
   b. Parent says, "Come here", and child says, "No." (not food-related)
   c. While eating, child slips from chair. (accidental, not tantrum)

6. Social interaction (SI): This category is scored for non-food-related, and food-related non-aversive vocalizations or non-aversive physical contacts

directed toward the parent. The vocalizations are considered food-related if they occur in conjunction with eating (E) or have as their subject specific foods, mealtimes, the place for eating, utensils, or eating, in general.

Instances scored as SI (non-food-related):
a. Child affectionately pats parent's arm.
b. Child coos or sings, while oriented toward parent.
c. Parent says, "How are you feeling", and child says, "OK."
d. Child laughs while being tickled by parent.

Instances scored as SI (food-related):
a. While eating, child affectionately pats parent's arm.
b. Child says, "This [food] tastes good."
c. Parent says, "Do you like the juice?", and child says, "Yes" or nods head indicating a "yes" response.

Instances not scored as SI:
a. Parent says, "Are you my big boy/girl?", and child does not respond vocally.
b. Child slaps parents arm. (aversive)
c. Child cries.
d. Child looks toward parent and wiggles his/her arms while eating (ambiguous)
e. Child cries/yells, "No more meat!" (aversive)

Appendix H

Training Procedures for the Feeding Interaction Code (FIC)

Assistants were trained over several months to reliably code videotapes of mealtime interactions using the FIC. First, the FIC definition manual (see Appendix G) was presented to the assistants, and unedited videotapes of mealtime interactions between hospitalized children (aged 4 to 30 months) and their parents were viewed and coded. Written quizzes were used weekly to document mastery over various aspects of the code for the first four weeks of training and at regular intervals thereafter. Errors on the quizzes were discussed as a means for further education with regard to subtleties in the code and for identification of aspects of the code needing modification. Next, videotapes edited to include digital display and tone at each 15-second interval change were coded and interobserver agreement was determined. Interobserver reliability was calculated using the occurrence-only formula of Agreements divided by Agreements plus Disagreements multiplied by 100. Following the coding of each tape, a discussion of agreements and disagreements ensued to further educate the assistants in the appropriate use of the code.

When reliability consistently approached 80%, three reliability criteria tapes were chosen to establish interobserver agreement of at least 80% prior to coding for

data collection. These tapes showed the mealtime interactions between a 4-month-old, a 14-month-old, and a 27-month-old and their respective parents. One child featured in the videotapes was hospitalized for an acute illness, one was diagnosed as NOFTT, and the other was diagnosed as OFTT. The assistants viewed each tape and clarified any difficult to hear verbal interactions without discussing specific impressions of how a given behavior should be coded. Each tape was then viewed to determine percent agreement. The parent's behavior was coded first, the tape was rewound, and then the child's behavior was coded.

Interobserver reliability was calculated using the occurrence-only formula of Agreements divided by Agreements plus Disagreements multiplied by 100. Overall percent agreement exceeded the *a priori* 80% training criteria (*M*= 89.6%, range=83.0%-97.1%), as did agreement across both parent (*M*=89.1%, range=84.8%-97.5%) and child (*M*=89.6%, range=80.0%-96.6%) categories. The range of percent agreement across each of the observational categories was within acceptable limits was well (range=75.0%-100.0%).

VITA

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Presentations at Professional Conventions

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Buss, R.R., Stanley, W.B., Kauchak, D., Slaton, E., & Heffer, R.W. (1986, April). An examination of the influence of teachers' knowledge of management skills and student ability on students' time-on-task. Paper presented at the meeting of the American Educational Research Association, San Francisco, CA.

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Harris, C.V., Bradlyn, A.S., Rigney, B., Heffer, R.W., & Ritchey, K.A. (1988, March). Relationship between observations and staff ratings of children's behavior during medical procedures. Paper presented at the meeting of the Society of Behavioral Medicine, Boston, MA.

Raymond, K.L., Heffer, R.W., Kelley, M.L., & Fishbein, J. (1988, April). Development of a behavioral assessment strategy for failure to thrive infants and their caregivers. Paper presented at the meeting of the Florida Conference on Child Health Psychology, Gainesville, FL.

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